627
L932
1902/04
cop. 2

# REPORT

OF THE

# Board of State Engineers

OF THE

STATE OF LOUISIANA

TO

HIS EXCELLENCY, WILLIAM WRIGHT HEARD,

GOVERNOR OF LOUISIANA,

FROM

APRIL 21, 1902, to APRIL 20, 1904.

BATON ROUGE,
THE ADVOCATE, OFFICIAL JOURNAL OF THE STATE OF LOUISIANA,
1904.

# REPORT

OF THE

# Board of State Engineers

OF THE

## STATE OF LOUISIANA

TO

**HIS EXCELLENCY, WILLIAM WRIGHT HEARD,**

GOVERNOR OF LOUISIANA,

FROM

APRIL 21, 1902, to APRIL 20, 1904.

---

BATON ROUGE,
THE ADVOCATE, OFFICIAL JOURNAL OF THE STATE OF LOUISIANA,
1904.

627
L932
1902/04
cop. 2

# REPORT

OF THE

# Board of State Engineers

---

Office Board of State Engineers.
State of Louisiana,
New Orleans, La., April 20, 1904.

*To His Excellency, W. W. Heard, Governor of Louisiana.*

Sir: The Board of State Engineers has the honor to submit for your Excellency's information the following report, with accompanying appendices, covering the period from April 21, 1902, to April 20, 1904.

## Duties and Personnel of the Board.

The Board of State Engineers was created by Act 33, approved February 10, 1879. The duties of the Board, as defined by this Act, are to make surveys of water courses, public works and levees of the State; to "report to the Governor of the State the improvements necessary and the levees to be constructed, which are of prime importance to the State at large;" to furnish estimates and specifications of the work so required; to examine and measure the work recommended by the Board and done under contracts made by the State, and to certify the amount of payments due for work thus executed.

Under the provisions of later laws the Board has been made, in general terms, the engineers and advisers of fourteen out of the fifteen Boards of Levee Commissioners now organized in the State, viz:

1. The Fifth Louisiana Levee District, by Act 44 of 1886.
2. The Tensas Basin Levee District, by Act 59 of 1886.
3. The Red River, Atchafalaya and Bayou Bœuf Levee District, by Act 79 of 1890.
4. The Pontchartrain Levee District, by Act 95 of 1890.
5. The Atchafalaya Basin Levee District, by Act 97 of 1890.
6. The Lafourche Basin Levee District, by Act 13 of 1892.
7. The Lake Borgne Basin Levee District, by Act 14 of 1892.
8. The Caddo Levee District, by Act 74 of 1892.

9. The Bossier Levee District, by Act 89 of 1892.
10. The Buras Levee District, by Act 18 of 1894.
11. The Cat Island Levee District, by Act 110 of 1894.
12. The Grand Prairie Levee District, by Act 24 of 1898.
13. The Plaquemines Parish East Bank Levee District, by Act 7 of 1902.
14. The Courtableau Levee District, by Act 166 of 1902.

The Orleans Levee District was created by Act 93 of 1890; but under the provisions of Act 79 of 1892, the only duty of the Board of State Engineers is to approve or disapprove the "location, construction and repairs of all levees on the river front of said District."

Act 144 of 1888, makes it the duty of the Board "to furnish such lines and levels, plans and estimates as may be considered necessary for the proper and efficient execution of the work" to be done by the Board of Control of the New Basin Canal.

Article 294 of the Constitution of 1898, directs that the Board, "whenever called on so to do, shall furnish the different road districts with plans and specifications for public roads, and such assistance and advice as will tend to create a uniform system of public roads throughout the State;" and under Article 239 it devolves upon the Board, in certain cases, to give to or withhold from the Boards of Commissioners of the several levee districts of the State, authority to contract with or permit steam railroad corporations to construct, maintain and operate railroad tracks upon the public levees.

Acts 123, 124 and 171 of 1902, require the Board—when directed by the Governor—to make surveys, subdivisions and plats of certain unsurveyed lands belonging to the State.

The Board has been called upon by the joint organization of the Atchafalaya Basin and Lafourche Basin Levee Boards, provided for under Act 9 of 1900, to make the elaborate surveys, with plans, specifications, etc., necessary for the lock and temporary dam, and the improved channel in Bayou Lafourche, as authorized or required by this Act and by Act 84 of 1902; and also by other Levee Boards to continue examinations and surveys for a number of extensive drainage works proposed or undertaken by them.

The performance of these duties has required the constant care and attention of the members of the Board during the past two years, and has required the regular employment of three or four surveyors and rodmen as assistants in the field, as well as the temporary services of other employes both in the field and in the office.

The increasing amount of engineering work necessary for the examinations, surveys, estimates, plans and reports requisite for prosecuting the numerous works executed or projected by the various levee districts, and the additional duties devolving upon the Board by new undertakings authorized or provided for at each successive session of the Legislature, has largely augmented the expenses as well as the care and labor involved. The appropriations made for the necessary mileage, assistance and expenses of the Board of State Engineers have, hence, become insufficient to fully meet the increased demands for surveys and office work. For the efficient performance of the duties now demanded from the Board it is necessary that a larger sum than heretofore be appropriated from the General Engineer Fund for carrying on the engineering work of the levee districts, and for transportation, employment of assistants, hire of labor and other necessary expenses.

During the period covered by this report the several members of the Board of State Engineers have given their attention, as heretofore, to the affairs of all the levee districts, and to duties in any of them as the occasion required. As a matter of convenience, however, the engineering work in the Pontchartrain, the Lafourche Basin, the Lake Borgne Basin, the Buras, the Grand Prairie and the Plaquemines Parish East Bank Levee Districts, has received the special attention of Assistant State Engineer Lewis. Assistant State Engineer Perrilliat has performed the duties required for the work of the Atchafalaya Basin Levee District, and has attended to most of the work called for by the Board of Control of the New Basin Canal and Shell Road and by the joint Atchafalaya and Lafourche Levee Boards for the improvement of Bayou Lafourche. Assistant State Engineer Robertson has given special attention to the work in the Fifth Louisiana Levee District and to that of the Tensas Basin Levee District in Arkansas; and Assistant State Engineer Kerr has attended to the work in the Caddo, the Bossier, and the Red River, Atchafalaya and Bayou Bœuf Levee Districts.

Chief State Engineer Henry B. Richardson having been appointed a member of the United States Mississippi River Commission, resigned, on March 31, 1904. On April 7th following, Frank M. Kerr was appointed Chief State Engineer, and Gervais Lombard, Assistant State Engineer.

## LEVEE WORK OF THE PAST TWO YEARS.

The work of improving the public levees in Louisiana and of those directly protecting Louisiana in the lower counties of Arkansas has been continued during the period since our last biennial report by the several levee districts, by the State, and by the United States.

The total amount of this work done between April 21, 1902, and April 20, 1904, by the United States, the State, and the Levee Districts, is shown in the following table:

| WORK DONE | Miles of New Levee Built | Miles of Levee Raised and Enlarged | Cubic Yards of Earthwork | COST |
|---|---|---|---|---|
| By the Levee Districts | 50.67 | 87.77 | 7,906,333 | $1,647,978.36 |
| By the State of Louisiana | 25.13 | 36.59 | 2,637,369 | 449,620.15 |
| By the United States | 6.22 | 54.98 | 3,535,701 | 580,433.50 |
| Aggregates | 82.02 | 179.34 | 14,079,403 | $2,678,032.01 |

As regards locality, the work may be divided as follows:

| LOCALITY | Miles of New Levee built | Miles of Levee Raised and Enlarged | Cubic Yards of Earthwork | COST |
|---|---|---|---|---|
| IN ARKANSAS | | | | |
| On the Mississippi River | 2.92 | 14.41 | 1,131,164 | $ 245,780.36 |
| IN LOUISIANA | | | | |
| On the Mississippi River | 41.61 | 144.26 | 9,823,564 | 1,892,077.77 |
| On the Red River | 22.94 | 10.86 | 2,097,966 | 355,549.16 |
| On the Atchafalaya River | 7.59 | 3.94 | 677,518 | 133,441.31 |
| On Bayou Rapides | ...... | 0.13 | 3,331 | 1,594.08 |
| On Bayou des Glaizes | 0.08 | 3.40 | 76,395 | 12,315.66 |
| On Bayou Lafourche | 0.13 | 2.34 | 96,320 | 21,256.83 |
| On the Gulf Coast | 6.75 | ...... | 173,155 | 16,016.84 |
| Aggregates | 82.02 | 179.34 | 14,079,403 | $2,678,032.01 |

The foregoing tables do not include the extensive drainage work done during this period by the Red River, Atchafalaya and Bayou Bœuf Levee District, costing about $107,000, of which class of work there still remains, under the original project and estimates, some $82,000 worth of work to be done. Nor do they include the work for the improvement of Bayou Lafourche, by a lock, dam and other channel improvements, which have been undertaken by the Atchafalaya Basin and Lafourche Levee Districts, on which some $54,000 were expended during the same period, leaving some $371,000 to complete the project.

There remains, in addition to the above, under contracts of the State and the several levee districts now in course of execution, a large amount of levee work still to be done, estimated to require about 1,700,000 cubic yards of earthwork, and to cost about $200,000.

A considerable amount of work was also done and expenditures incurred, by the levee districts and by the United States, for protection work during high water, for weed cutting, minor repairs, auxiliary work of various descriptions, and for wooden revetments, for which the information is not in all particulars at hand to base a positive statement, but which must aggregate a considerable sum.

Details relative to the location, character, extent and cost of the levee work of the past two years will be found in the paragraphs of this report headed the "Levee Districts," and in tabular form in Appendix A.

## THE LEVEE SYSTEM.

The system directly protecting Louisiana includes not only the public levees within the State, but also those in Arkansas south of the Arkansas River. Levees have been built by the State of Louisiana and its several levee districts at one time or another on the Mississippi, Red, Ouachita, Black, Little, Tensas and Atchafalaya Rivers, and on Bayous Rapides, des Glaizes, Bon Idee, Courtableau and Lafourche, within the State; and in Arkansas, on the Mississippi and Arkansas Rivers, and on Cypress Creek and Amos Bayou. But since the great improvement of levees made within the last twenty years on the Mississippi River above the mouth of Red River, those on the Black and Ouachita and their tributaries, have become of minor importance, because of the more complete exclusion from their basins of overflow from the Mississippi.

Levee work for a number of years past has, therefore, been principally applied on the Mississippi, Red and Atchafalaya Rivers, and on Cypress Creek, Bayou des Glaizes and Bayou Lafourche. The recent closure of Bayou Lafourche, at its head, by a temporary dam, pending the construction of a lock, will render the maintenance of a levee system, some hundred and sixty miles in length on that stream, unnecessary hereafter.

At present the principal lines of continuous levee protecting the alluvial lands of Louisiana against overflow, are as follows:

1. From the highlands near Pine Bluff, Ark., down the right bank of the Arkansas River to within about eight miles of its mouth. The lower half of this line has been greatly improved within the past few years, about fifteen miles of it, below Red Fork, having been built and maintained by the United States.

2. From Costello's Gin, a point on Amos Bayou—about five miles south of Red Fork and about twelve miles west of the mouth of the Arkansas—a continuous line of levee extends down the left bank of Amos Bayou about five miles; thence—crossing Boggy Bayou—to the right bank of Cypress Creek about 1.5 miles; thence about six miles down the right bank of Cypress Creek to Lucca Landing, on the Mississippi River, where it joins the levee system on the right bank of the Mississippi; and thence continuing down through Desha and Chicot Counties, Ark., and the Fifth Louisiana Levee District to near Bougere Landing, in Concordia Parish, about 295 miles below Lucca Landing; thus making one unbroken line from Costello's Gin, Ark., to Bougere Landing, La., about 307.5 miles in length. Immediately below the latter point there is a gap in the levee line, known as Bougere Crevasse, and below this about 8.5 miles of new levee, bringing the end of the present levee system to within about 11 miles of the mouth of Red River.

3. From Torras Landing at the mouth of Red River (or more properly the mouth of Old River) the levee extends down the right bank of the Mississippi without break or interruption to the outlet known as the Jump; that is, to within about 10 miles of the Head of the Passes, a length of about 288.1 miles.

And from the same point at Torras Landing, the levee line runs along the south bank of Old River 7 miles to Barbres Landing; and thence down the left bank of the Atchafalaya River to and across Sherman's Bayou, a length of about 41.9 miles. These lines thus form a continuous system on the Atchafalaya, Old and Mississippi Rivers, 337.0 miles in length.

4. On the left bank of the Mississippi River the levee line extends uninterruptedly from Baton Rouge to what is known as the New Canal, about 5 miles below Fort St. Philip, a length of about 215.5 miles.

5. The upper levee system of the Caddo Levee District on the right bank of Red River, extends from Blanton Bluff, Ark., about 1.5 miles above the Louisiana line to Gold Point, a length of about 45 miles of levee.

6. The lower levee system of the Caddo Levee District—also on the right bank of Red River—extends from the bluffs, on the north side of Bayou Pierre, to the lower limits of Caddo Parish, a length of about 35 miles of levee.

7. The levees of the Bossier Levee District, on the left bank of Red River, extend from Hurricane Bluff to Dennison Plantation, a length of 58 miles of levee.

8. The upper levee system of the Red River, Atchafalaya and Bayou Bœuf Levee District is continuous from the highlands of Bayou Rapides—about one and a half miles above the mouth of the bayou—down the bayou to its junction with Red River, at Alexandria, about 1.5 miles, and thence down Red River to the Avoyelles Prairies—at David's Ferry—about 35.5 miles in length.

9. The lower system of the Red River, Atchafalaya and Bayou Bœuf Levee District is continuous on the right bank of Bayou des Glaizes from "The Junction," about 9 miles above Moreauville, down the bayou to its junction with the Atchafalaya River, at Simmsport, about 48 miles; and thence down the Atchafalaya River to a point 4 miles below Melville, a length of about 30 miles, making a total of 78 miles of levee.

The aggregate length of the levee lines above described is 1,126.5 miles, 101.3 miles of which are in the State of Arkansas, and the remainder, 1,025.2 miles, in Louisiana. (For tabular statement of length of levee line, see Appendix B.)

## THE CONSTRUCTION OF LEVEES.

Owing to the higher grade recommended and adopted for levees, and being generally observed in their construction, the number of cubic yards to the running foot is much greater than was previously required.

The new levees, therefore, undertaken steadily involve work of greater magnitude and larger expenditure than heretofore, not only in the increased quantity of earthwork, but in the price per cubic yard. The question of time, too, required for their construction is now a far more serious proposition than in the past, and it is evident that from a standpoint of safety alone and to insure completion within proper limits of time, that new levees should be undertaken in advance of the time when their immediate need only seems demanded.

In support of this view the Board of State Engineers cannot do better than quote from its last report, as follows:

"It is impossible to predict with certainty the exact time when a levee will be breached by the caving river banks, and this fact has sometimes caused the undertaking of new levees some considerable time before they were actually needed. It is plainly the duty of the authorities in charge to take no unnecessary chances in the premises, and, whenever means can be made available, to begin the construction of these important works in time for them to be completed, if possible, before the existing lines are destroyed by the caving of the banks; for although the old levees do not always cave into the river as soon as may have been expected when the new levees were undertaken, and it may then appear that work has been done before the actual need for it has developed, yet, under the circumstances, there seems to be no other safe course to pursue.

"The increased height of the levees and the consequent addition to the labor and difficulty attending their construction, have shown that the present methods of doing the work should be improved. Levees in many localities are becoming too large and too high to at all times be built to advantage by men with wheelbarrows, or for the best results in economical construction with mules and scrapers. It would seem that the use of power-driven machinery in levee building may be the proper solution of this difficulty. Several attempts have been made in this direction, and although machines have been devised which give satisfactory results under certain conditions, yet up to the present time no system of machinery has been introduced which will meet all cases.

"The Board of State Engineers invites the attention of engineers and contractors interested in earth handling machinery to this field of work, believing that in it will be found a source of profit both for the contractors and the State.

## THE LEVEE DISTRICTS.

The creation of the Plaquemines Parish East Bank Levee District by Act 7 of 1902, and the Courtableau Levee District by Act 166 of 1902, makes the present number of levee districts in the State fifteen. They all have corporate powers exercised under the administration of boards of commissioners varying in number from three to nine; and all, except the Orleans Levee District, are empowered to levy *ad valorem* taxes for levee purposes, not exceeding the constitutional limit of ten mills on the dollar, and to impose local assessments on lands. Most of them have also power to levy assessments upon agricultural products raised within their territory and upon railroads of standard gauge. All of them have authority to issue bonds. The aggregate of district levee bonds now authorized in all the districts, excluding the Cat Island Levee District, is $4,899,000. The total assessed valuation of the same levee districts is $209,029,008.

*The Tensas Basin Levee District* comprises the Parishes of Morehouse, West Carroll, Richland, Franklin and Catahoula, with those portions of Ouachita and Caldwell Parishes lying east of the Ouachita River. The alluvial lands liable to overflow within this territory are subject to taxation and local assessment for levee purposes. The district is more exposed to overflow by flood waters escaping from the Mississippi and Arkansas Rivers in Arkansas, than from any other source, and its work has always been mostly applied to the construction and improvement of levees in Desha and Chicot Counties, Ark., as is contemplated in the Act (No. 59 of 1886) under which the district was organized.

The United States "Upper Tensas District" includes the same levee line, and the larger part of the levee work done on this line of levees since 1881 has been by the United States.

The Board of Levee Commissioners consists of seven members, one appointed from each Parish or part of Parish in the district.

The assessed valuation on the tax rolls of 1903 was $3,809,852.

The work done by the district during the past two years has been as follows, viz: 4.17 miles of enlargement, aggregating 309,156 cubic yards of earthwork, at a cost of $96,715.16.

The total amout and cost of levee work done by the United States during the past two years in Desha and Chicot Counties, Arkansas, is as follows: 2.92 miles of new levee, and 10.24 miles of levee enlargement, involving 822,008 cubic yards of earthwork, at a cost of $149,065.20.

The folowing extract from our report of April 21, 1902, describes the levee situation in Desha and Chicot Counties, Arkansas:

"The line of the so-called Opossum Fork levee turns up Amos Bayou and follows it closely to Costello's Gin. This point is, at present, the head of the system. It is not, however, as sometimes supposed, on land above high water, for during such floods as that of 1897 a considerable volume of water flows around the head of the system and finds its way into Bayou Macon and other streams, and thus into Louisiana.

"It is difficult to obtain the necessary right of way for the extension of this line to a point above overflow, because some of the owners of the land through which it would have to be located object to the extension of the system, and have already thrown obstacles in the way of the maintenance of the present line. Suits have been brought and are understood to be still pending to compel the removal of the levee line along Amos Bayou and to force the opening of Boggy Bayou.

"The district at various times in the past has expended considerable amounts in the maintenance of the levee line on the south bank of the Arkansas River, and a project has been favored by citizens of that section to extend the levees from the lower end of the present system on the Arkansas River to join the existing line on Cypress Creek, at or near Boggy Bayou, and to re-open the latter for drainage.

"This project, if carried out, would have the effect of increasing the length of line upon which the Tensas Basin District directly depends for protection by more than 60 miles, and would make the district subject to overflow from the Arkansas River in the event of a break in the Red Fork or Lincoln County line, as the flood waters of the Arkansas would then be cut off by the proposed levee line from returning into the Mississippi River anywhere above the mouth of Red River.

"The Tensas Basin Levee Board, in aiding the construction and maintenance of levees in Arkansas, is, of course, subject to the laws of that State, the alluvial territory of which forms but a small proportion of the whole, and in which the privileges and authority given by law to the levee districts of this State do not exist. The whole matter of the location of levees and the expropriation of lands for their construction must be met by the Desha and Chicot Levee Districts. The latter comprises the entire county, whereas the former includes only a part of Desha County, in which there are three levee districts, namely, the Laconia, the Red Fork, and the Desha Districts. The Laconia District lies north of the Arkansas River, and hence is not of direct interest to the State of Louisiana. The total revenue of the Red Fork and the Desha Districts is less than $6,000 per annum, while that of the Chicot District is about $8,000. These sums would not go far towards the protection of any threatened point nor pay for the construction of any extensive new levee, especially where the land thrown out would have to be paid for. These districts, therefore can hardly be depended on to do more than furnish right of way; and so the United States and the Tensas Basin Levee District must probably continue, as heretofore, to supply the larger share of the means for maintaining and improving the levees."

*The Fifth Louisiana Levee District* is composed of the Parishes of East Carroll, Madison, Tensas and Concordia.

Its assessed valuation on the tax rolls of 1903 was $6,464,219.

It has a frontage on the Mississippi River of 235 miles, and a continuous levee line of 218 miles, covering 207 miles of river front. Below the end of this line of continuous levee—near Bougere Landing—there is an unleveed gap of about 6½ miles, known as the "Bougere Crevasse," and immediately below this gap a line of new levee has just been completed which brings the lower end of the levee system of this district to within about 11 miles of the mouth of Red River.

The levee line of the northern part of the district, above a point oposite Warrenton, Miss., is included in the United States "Upper Tensas District," and the southern part in the United States "Lower Tensas District."

There are eight Levee Commissioners—two appointed from each Parish.

The amount and cost of the work done in the district during the past two years by the district, the State and the United States, is approximately as follows:

| WORK DONE | Miles of New Levee Built | Miles of Levee Raised and Enlarged | Cubic Yards of Earthwork | COST |
|---|---|---|---|---|
| By the District .................... | 7.54 | 28.89 | 2,313,912 | $ 540,945.25 |
| By the State.................... | 10.42 | 9.53 | 827,447 | 123,769.01 |
| By the United States ............. | 0.10 | 19.74 | 1,214,929 | 220,953.46 |
| Totals........................ | 18.06 | 58.16 | 4,356,288 | $ 885,667.72 |

The high water of 1903, at Ashton, near the Louisiana-Arkansas line, at the head of the Fifth Louisiana Levee District, reached a stage of 2.2 feet above that of 1897, which was the highest of previous record, and was rising at the rate of two-tenths of a foot in twenty-four hours when a crevasse occurred, on March 26, 1903, on the Mississippi side, which was at first reported to be at Swift Water, but was afterwards ascertained to be at La Grange, about 4 miles below Greenville. At Lake Providence, 30 miles below Ashton, the high water of 1903 was 1.9 feet above that of 1897; at Vicksburg, 57 miles below Lake Providence, the highest stage reached in 1903 was 0.7 feet below that of 1897; at St. Joseph, 0.2 feet above that of 1897; at Natchez, 0.6 feet above that of 1897, and at Bougere, 0.3 feet below that of 1897.

The largest crevasse of the year occurred in the Fifth Louisiana Levee District, at Hollybrook, 5 miles below Lake Providence, when the river had already fallen over 2 feet at Lake Providence, and 1¼ feet at Vicksburg. It of course had no influence upon the maximum stage in that locality. This crevasse occurred in a very large and comparatively high-grade levee, and was without premonition to those who had charge in the immediate vicinity. The levee at the point at which the break occurred was 22 feet in height, and had about 18 feet of pressure against it, standing four feet above the water line as it then was.

It will always be a matter of conjecture as to just how this crevasse occurred, since being in appearance one of the best embankments in the district less watchfulness was accorded to it than to the rest of the levee line immediately above and below. It is evident that it occurred from a defect near the water line, as those who first saw it described it as having begun from a leak about the size of one's arm pouring through about 4 feet below the crown. The material of which this levee was composed was a black loam, and the crevasse widened very rapidly. It occurred at 6:30, on the morning of April 3, and by 12 o'clock, by actual measurements, it had become 800 feet wide, and the rate of widening increased at this ratio until the following day it had become 1,600 feet wide and finally reached a width of 3,400 feet, digging a gulch 3,400 feet long, 1,000 feet wide, and 74 feet deep below the surface of the ground across the break. No attempt was made to close this crevasse, as the rate of widening was so rapid as not to justify any steps in this direction.

Exact information as to the area and limits of overflow from this crevasse was not easily obtainable, but attempts were made to gather this information through the local surveyors of the several parishes affected by it, and the following statement is believed to be approximately correct.

The overflow from Hollybrook crevasse covered over two-thirds of the two upper parishes of the district; that is, East Carroll and Madison. In the latter Parish the overflow was confined to the western part, leaving the cultivated lands on the river front untouched. The course of the water was towards the Tensas River and Bayou Macon, and thence down these streams and through the low wooded lands adjacent, and across them into Franklin and Catahoula Parishes, passing between the highlands of Sicily Island on the west and the banks of the Tensas on the east, and mingling in Black River some miles below the junction of the Ouachita and the Tensas, with the back water from Red River and Bougere.

The total area of overflow directly due to the Hollybrook crevasse is estimated at 930 square miles, about 46,200 acres (say 72 square miles) of which is cultivable land, in the Fifth Louisiana Levee District.

Owing to the unusual rains in the Mississippi valley, which occurred in the latter part of May in the same year, an alarming stage of the Mississippi was again expected, and immediate steps were taken for the construction of a run-around, to keep out what is known as the June rise.

Mr. McClellan, President of the Fifth Louisiana Levee Board, and Assistant State Engineer Robertson of the Board of State Engineers, hurried to the scene, and after making a careful reconnaissance of the situation, concluded to do what was possible for the construction of this run-around. The long stretch of islands, lying directly in front of Hollybrook, which was at one time a rapidly caving bank, has caused very little deposit to settle on the banks, and this point is extremely low, overflowing at 31.2 feet on the Lake Providence gauge, at the lowest point; and the line upon which the location was made was four feet lower than the crest of the bank.

The water, therefore, had ceased to flow through the Hollybrook crevasse, but ten days from the spring rise, before the water began to reach such a stage, from the June rise, as to flow through again. It was, therefore, seriously considered whether it were better to make a fight on a protection line, or on the line located for the permanent levee, but as the time was not sufficient for the construction of any work on the permanent line, a desperate attempt was made on the bank of the river in front of Hollybrook.

The shortest line that could be had at this point was 145 stations, or very nearly three miles in length. The intow of the current and the heavily wooded banks had caused much drift of all descriptions to settle on the front where the location was to be. A large force was immediately put to work and succeeded in clearing the drift and the smaller timber from the line. A line of levee

145 stations in length and averaging in height about six feet, with slopes of 1½ to 1 and 4 foot crown was constructed on this line between June 4 and 14. At first the task was considered hopeless, but the great interest behind this levee justified the attempt. It was considered at the time this protection levee was begun that the highest stage reached at Lake Providence would not exceed 35 feet, but the stage at the time the protection levee was overtopped was 36.2 on June 15. It ultimately reached 38 feet.

In the attempt to hold this levee, more than 300 wheel-scrapers and teams were used, and 830 men, the cost exceeding $20,000 to the district. The effect of this second break was to overflow practically the same area as that overflowed by the crevasse in April.

Immediately upon the recession of the water in June a survey was made and a contract let for the construction of a new levee around the Hollybrook break, which was completed on January 1, 1904. This levee has a grade three feet above the highest water and contained approximately 400,000 cubic yards.

In our report of April 21, 1902, it was stated that, "The Texas and Pacific Railway Company in extending its line of railroad up the west bank of the Mississippi river, now has under construction an embankment through the Bougere swamp. A portion of this embankment is built to a height about the same as that of the high water plane of 1897; though it has neither the width nor the area of cross section usually prescribed for a levee of the same height, nor has it been built with such care as regards the preparation of the ground on which it stands and the exclusion of improper materials from its composition, as is now generally thought necessary for security.

"At the same time it is probable that this embankment might serve as a levee against such moderate floods as have occurred in at least six out of the past ten years, and it might be possible to enlarge and strengthen it some time in the future, if means become available, and make it as secure as any other line of levee.

"It has, therefore, been decided by the Fifth Louisiana Levee District, upon the recommendation of this Board, to undertake the construction of a new levee from a point about half a mile above Bougere landing to join this railroad embankment near Boggy bayou; and the president of the Board has been authorized to advertise for proposals to this and for the construction of about 300,000 cubic yards of new levee."

* * * * * * *

"It is not to be expected that the extension of the levee line on the front of the Mississippi river, even as far as the mouth of Red river, with that tributary remaining unclosed, would absolutely protect the back lands of Concordia and Catahoula parishes against high water from the Mississippi. This end could only be obtained if Old River were diked and entirely divorced from the Mississippi."

The levee line was extended as proposed, and joined to the railroad embankment, which was so far completed before the flood of 1903 as to have a track laid on it for construction trains, though lacking in some places two feet or more of its designed grade.

The railroad bank thus served the purpose of a levee only until the river rose to within about three and a half feet of the highest stage reached in 1897, when it broke on March 14, 1903. The break rapidly widened, so that on the decline of the flood about three miles of the railroad bank had been washed away, as well as about 1.8 miles of new levee just completed by the district.

The importance of the permanent closure of this gap to the lower part of the Fifth Louisana Levee District cannot be overestimated.

Although the stage of water in Red river, just previous to the time that the railroad embankment succumbed, was very high, it was, nevertheless, seven feet lower than that in the Mississippi river, on the opposite side, and thus, up to that time, the tillable lands in Concordia parish, situated next to the Mississippi river front, above the Bougere crevasse, were free from back water. However, as a result of the failure of this railroad embankment to withstand the flood, and the consequent washing away of the levee line adjoining it above, more than 80 per cent. of the area of the parish was inundated. No similar effect to that part of the Fifth Louisiana Levee District would result from any single crevasse occurring in the line of levee above in East Carroll or Madison parishes, as was formerly the experience.

The waters of the Hollybrook crevasse of 1903, thirty-five miles below the state line, followed a route to the west of the Tensas river, between that stream and Sicily island, and did not to any appreciable extent affect the inflow of water at Bougere.

*The Atchafalaya Basin Levee District* is composed of the entire parishes of Pointe Coupee, West Baton Rouge and Terrebonne, and of parts of the parishes of Iberville, Ascension, Assumption, Lafourche, St. Martin, St. Mary and Iberia.

Its assessed valuation on the tax rolls of 1903 was $13,564,881.

It has a frontage of 121 miles on the Mississippi river, extending from Torras to Donaldsonville; of 7 miles on Old river, extending from Torras to Barbres landing, and is bounded on the west by the Atchafalaya river, 41 miles of which stream is leveed. It has 121.1 miles of levee line on the Mississippi river, 7 miles on Old river, and 41.9 miles on the Atchafalaya river. It still has 80 miles of levee line on Bayou Lafourche, which, under the terms of Act 84 of the Legislative session of 1902, must not be disturbed; but since December 10, 1903, Bayou Lafourche has been divorced from the Mississippi river by the construction of an earth dam at Donaldsonville, and therefore Bayou Lafourche is no longer directly subject to the fluctuations which rendered a levee line necessary along its banks.

The Board of Commissioners governing the district is composed of seven members, three of whom are appointed from the Mississippi river parishes, three from the interior parishes, and one at large on the recommendation of the railroads of the district.

The domicile of the Board is at Port Allen, West Baton Rouge Parish, La.

During the last two years the levee work done by the levee district, and by the state, has been mostly confined to the Mississippi and Achafalaya rivers. That done by the United States government has been entirely on the Mississippi river. On the Mississippi river, the Solitude new levee, previously undertaken, has been completed, the Palo Alto, Taylor, Irvine and Chapman new levees were built, and the Eliza, Lefebvre and Texas new levees were undertaken. The construction of these new levees was rendered necessary by the caving of the banks at these points, and they aggregate 4¾ miles in length. In addition to this 20.1 miles of levee were raised and enlarged to Commission grade and standard section. The Commission grade is 4.4 feet above the high water of 1897 at Torras, and 4.2 feet above the same plane at Donaldsonville. The standard section adopted within this district has a crown 8 feet wide, and slopes of three horizontal to one vertical, on both the river and land sides, where the levees are less than 15 feet in height. Where they are over 15 feet in height, a slope of four horrizontal to one vertical is given to the land side.

On the Atchafalaya river, the work has consisted of the construction of 7 miles of new levee beginning from a point four miles below Melville, and extending to a point about a half a mile above the head of Alabama bayou, which is situated 12 miles below

Melville. Although no standard grade has yet been adopted for the extension of the levee system on this stream, the line has been built nowhere less than three feet above the highest water of the past, and near the lower end of the line nearly five feet above the highest water of the past in anticipation of the probable increase in flood height which will occur in the future owing to the further confinement of the waters of the Atchafalaya river resulting from the extension of the levee line.

The following table gives the length and contents in cubic yards of the work done in the Atchafalaya Basin Levee District during the last two years:

| WORK DONE | Miles of New Levee Built | Miles of Levee Raised and Enlarged | Cubic Yards of Earthwork | COST |
|---|---|---|---|---|
| ON THE MISSISSIPPI RIVER. | | | | |
| By the District | 2.52 | 12.30 | 1,057,873 | $ 222,482.22 |
| By the State | 0.72 | 4.97 | 325,960 | 52,263.77 |
| By the United States | 0.48 | 1.76 | 141,594 | 21,542.94 |
| Totals | 3.72 | 19.03 | 1,525,427 | $ 296,288.93 |
| ON THE ATCHAFALAYA RIVER. | | | | |
| By the District | 6.68 | 0.31 | 455,039 | $ 86,715.41 |
| ON BAYOU LAFOURCHE. | | | | |
| By the District | 0.13 | 0.70 | 31,785 | $ 5,375.65 |
| RECAPITULATION THROUGHOUT THE DISTRICT. | | | | |
| By the District | 9.33 | 13.31 | 1,544,697 | $ 314,573.28 |
| By the State | 0.72 | 4.97 | 325,960 | 52,263.77 |
| By the United States | 0.48 | 1.76 | 141,594 | 21,542.94 |
| Grand Totals | 10.53 | 20.04 | 2,012,251 | $ 388,379.99 |

The high water of 1903 brought a severe strain on the levees of the Atchafalaya Basin Levee District, yet, owing to their improved condition they were, at no time, in danger and were amply sufficient to take care of the flood of that year. In many places softness of the slopes, and leaks became apparent during the passage of the flood, but at no time did these cause any anxiety nor were they beyond control of the ordinary remedies applied in such cases.

The flood of 1903 was 0.2 ft. below the highest water of the past (1897) at Torras, 0.7 ft. below the highest water (1897) at Baton Rouge, and 0.6 ft. below the highest water (1897) at Donaldsonville.

On Bayou Lafourche, however, the flood of 1903 assumed most dangerous proportions. Owing to the peculiar physical conditions governing that stream, which have been described at length in previous reports of this Board, the high water plane assumed record-breaking heights along the lower reaches of the bayou long before the high water mark had been reached in the Mississippi river. This abnormal flood height occasioned three crevasses on the right bank of Bayou Lafourche, two occurring on March 8th; the first at Falgout, 8½miles below Lockport, and the second at Guidry, 9½ miles below Lockport. These crevasses were caused by the overtopping of the levee, due to the excessive height of the flood. The third crevasse occurred at Howell's, about 2½ miles above the town of Thibodeaux, on March 2nd, and although the cause of this crevasse was never definitely ascertained it is thought to have been due to the scant section of the levee at that point. It is worthy of note that on March 8th, the date of the first two crevasses, the water at Donaldsonville, the head of Bayou Lafourche, read 27.8 on the gauge, which is 5 feet below the high water mark at that point, and that on March 22d, the date of the Howell crevasse, the Donaldsonville gauge read 30.9 feet, which is 1.9 feet below the high water mark at that point.

*The Cat Island Levee District,* in the Parish of West Feliciana, was created by Act 110 of 1894. It comprises the territory on the east bank of the Mississippi river from Ratcliff's landing to Bayou Sara. The act provided for the appointment of five levee commissioners, and authorized the issuance of bonds to the amount of $100,000.

As stated in previous reports, surveys have shown that the cost of levees necessary for the protection of this district would be excessive as compared with the probable revenues, and that even after building an effective levee system, the drainage of the district during prolonged seasons of high water, could only be maintained by the operation of costly pumping machinery. Under these circumstances no action has ever been taken by the commissioners for raising funds or for undertaking levee work. The act under which the district was created has never been repealed; and it still remains, as heretofore, a levee district only in name.

*The Pontchartrain Levee District* comprises the alluvial lands on the east bank of the Mississippi river between the cities of Baton Rouge and New Orleans, consisting of parts of the parishes of East Baton Rouge, Iberville, Ascension, St. James, St. John, St. Charles and Jefferson. Its situation is so favorable as to make it dependent for protection solely upon the integrity of its 126 miles of levee on the Mississippi river front.

The assessed valuation of the district, on the tax rolls of 1903, was $8,083,285.

There are nine commissioners, one from each parish in the district, and one representative, respectively, of the Illinois Central Railroad Company and of the Louisville, New Orleans and Texas Railway Company.

The domicile of the Board is at Convent, St. James parish, La.

The amount and cost of the work done in the district during the past two years by the district, the state and the United States, is approximately as follows:

| WORK DONE | Miles of New Levee Built | Miles of Levee Raised and Enlarged | Cubic Yards of Earthwork | COST |
|---|---|---|---|---|
| By the District.................... | 2.30 | 19.11 | 794,586 | $ 150,808.05 |
| By the State...................... | 1.16 | ...... | 269,139 | 49,790.71 |
| By the United States............... | 0.71 | 17.88 | 1,044,359 | 140,288.95 |
| Totals..................... | 4.17 | 36.99 | 2,108,084 | $ 340,887.71 |

In addition to the above the district has expended $6,687,16 on minor repairs to its levees, such as keeping the line free from weeds, cutting out crawfish and musk rat holes, construction of revetments, and the cleaning of drain ditches.

At Baton Rouge, the upper end of the district, the high water of 1903 was six tenths of a foot lower than that of 1897, while at Carrollton, the lower end of the district, it was two-tenths higher than that of 1897, the high water of 1897 being the highest of previous record at both places.

In view of the above condition, some 21.62 miles of the 126 miles of the levee line, which stood less than a foot above the high water of 1897, were raised. This was done with a small bank of earth from a foot to two feet in height placed on the water side of the crown of the levee and protected by one or two lines of inch plank at a cost of about $20,000, which expense was partly incurred by the United States government and partly by the district.

When the river gauge at New Orleans read over 19 feet, with every indication of a flood as high if not higher, throughout the district, than that of 1897, through the courtesy of the Illinois Central Railroad Company a patrol train was, on March 18th, tendered to the President of the Board to facilitate rapid delivery of material to the levees at points of threatened danger. This train remained in service from March 18th to April 28th, and proved a valuable factor on several occasions in preventing disaster to the levees of the district. In addition to this train, the executive officer of the United States government stationed boats loaded with material at convenient intervals along the line of levees, which could be easily and promptly moved to any point where needed. The planters also willingly gave assistance and aid whenever called upon by the proper authorities.

The high water protection work of 1903 cost the district $30,928.66, which sum includes the expenses defrayed by the district in the raising of 21.62 mile of levee just previous to the flood.

*The Lafourche Basin Levee District* comprises all of the alluvial lands, except the Parish of Orleans, lying between Bayou Lafourche, the Mississippi river and the Gulf of Mexico, namely: parts of the parishes of Ascension, St. James, St. John, St. Charles, Jefferson, Plaquemines (to the lower line of Riceland plantation), Assumption and Lafourche (as far down as the lower limits of "Chere Ami Canal"), requiring a levee line of 121 miles fronting the Mississippi river and 70 miles on the Lafourche.

The assessed valuation of the district, on the tax rolls of 1903, was $10, 847,699.

There are nine Commissioners—one from each parish in the district, and one from the district at large, appointed upon the recommendation of the railroads of the district.

The domicile of the Board is at Gretna, Parish of Jefferson, La.

The amount and cost of the work done in the district during the past two years by the district, the state and the United States, is as follows:

| WORK DONE | Miles of New Levee Built | Miles of Levee Raised and Enlarged | Cubic Yards of Earthwork | COST |
|---|---|---|---|---|
| By the District | 4.23 | 10.94 | 957,170 | $ 195,524.01 |
| By the State | 0.47 | 5.02 | 143,394 | 39,525.39 |
| By the United States | ...... | 4.29 | 185,631 | 28,191.05 |
| Totals | 4.70 | 20.25 | 1,286,195 | $ 263,240.45 |

In addition to the above the district has expended $34,094.89 on minor repairs to its levees, such as keeping the line free from weeds, cutting out crawfish and muskrat holes, construction of wooden revetments and the cleaning of drain ditches.

At Donaldsonville, the upper end of the district, the high water of 1903 was six-tenths lower than the highest previous water of 1897; at Gretna it was about eight-tenths of a foot higher than in 1897, and at Riceland, the lower end of the district, it was about 1.4 feet higher than in 1897.

There were two crevasses in the levees in this district, one in the Hymelia levee, near the upper end of the parish of St. Charles, and one in the Magnolia levee in the parish of Plaquemines.

The Hymelia crevasse had its origin in a hole at the base of the levee, discovered late at night on March 26th, 1903. This levee was built out on a batture formation in 1891 to supplant an old leaky and defective levee. It was enlarged in 1896, and gave no signs of weakness during the high water of 1897, but it is a known fact that when a hole takes place in a sandy or loamy levee it cuts out very rapidly and soon develops into a break. For over a month, strenuous efforts resulting in an outlay of about $130,000, were made to close the crevasse, but, owing to the treacherous character of the material at the bottom, a complete closure could not be effected, although at one time the cribbing had entirely surrounded the break. The final width of the crevasse in the line of levee was about 750 feet, its size and discharge having been greatly reduced by the constant work done in the endeavor to close it, so that the damage accruing was confined to the plantations submerged in the immediate vicinity.

The thirty-five miles of levee in this district situated in Plaquemines parish were subjected to a greater and longer strain from a higher flood in the river than ever known before, but owing to the improved condition of the levee line, and the constant and assiduous care on the part of the proper authorities during the flood, there was no disaster in this line of levees with the exception of a break that occurred in the levee through the caving of the bank at the upper end of Magnolia plantation on April 5th, 1903, when the water was near its highest stage and close to the top of the levee. This cave took in a part of the land side base of the levee for a length of about 230 feet, so that the water at once ran over the remaining part of the levee some two feet deep, and later on five or six feet deep. But prompt action on the part of the planters, with the co-operation of the Levee Board and the officials of the New Orleans, Fort Jackson & Grand Isle Railroad Company fortunately resulted in the secure closure of the crevasse within the next four days, before any serious damage was caused by overflow. The cost of this work to the Levee Board was about $7,000.

There were no breaks in the levees of this district on Bayou Lafourche during the flood of 1903, although the water rose to excessive heights, at some points, from 25 to 50 miles below its head, the stage reaching at least a foot higher than in 1897.

*The Orleans Levee District* was created by Act No. 93 of 1890. Under this act the Parish of Orleans was "formed into a public levee district," and a board of nine levee commissioners was provided for, seven being appointed by the Governor of the State, and two (the Mayor and the Commissioner of Public Works of New Orleans), being *ex-officio* members of the Board.

The engineer of the district has kindly furnished us with a tabular statement of the work done by the Board of Commissioners during the past two years under contracts costing $60,208.07 (for which see Appendix A), and with the following information relative to the length and grade of levees, and the cost of maintenance:

"During the past two years, only one new levee has been necessary, that from Adams to Short street in Carrollton. A cave at that point required the Board to fall back. Since the last report, a conference of the Port Commissioners, the Orleans Levee Board and yourselves, was held; and a new standard for the levee along the New Orleans front adopted. The new levee above referred to has been constructed in conformity with this new standard, except as to width of crown, and is considered the strongest levee in the state.

"Of course, no material differenec in the length of our levee line has been made, and there is still a length of 13.88 miles of levee on the right bank, and 12.62 miles on the left bank. The rear protection levees aggregate about 48 miles, making a grand total of about 74½ miles of levee.

"Of the river front levees, two miles are four feet above the high water of 1903, ten miles are three feet above, seven and a half miles are two feet above, one and a half miles are one foot above, two and three quarter miles are level with, and two and three quarter miles are below the high water of 1903.

"Besides the contract work set forth on the accompanying tabulated statement, the day forces have been kept busy making repairs wherever necessary, and while said repairs were individually small, they amount in the aggregate to considerable."

*The Lake Borgne Basin Levee District* comprises the alluvial lands on the east bank of the Mississippi river below the City of New Orleans, situated in the Parish of St. Bernard, and in that part of the Parish of Plaquemines lying north of the lower line of Bohemia plantation.

Its levee line is forty-eight miles long.

The assessed valuation of the district, on the tax rolls of 1903, was $1,761,728.

There are three Commissioners, one from each parish in the district, and one representative of the New Orleans and Southern Railroad Company.

The amount and cost of the work done in the district during the past two years by the state and the United States, is as follows:

| WORK DONE. | Miles of New Levee Built. | Miles of Levee Raised and Enlarged. | Cubic Yards of Earthwork. | COST. |
|---|---|---|---|---|
| By the State | 0.27 | 2.76 | 70,903 | $12,244 45 |
| By the United States | 0.44 | 1.07 | 66,427 | 9,858 56 |
| Totals | 0.71 | 3.83 | 137,330 | $12,103 01 |

The district has expended $23,370.08 on the construction of wooden revetments, raising and other repair and protection work. The high water protection work of 1903 cost the district $32,363.67.

The high water of 1903 was about eight-tenths higher than the highest previous water (1897) at the upper end of the district, and about 1.4 feet higher at the lower end of the district.

In consequence of the river below New Orleans having reached flood heights before similar stages developed in the upper river, the 48 miles of levee in this district were subjected to a greater and longer strain than ever known before, but owning to the improved condition of the levee line, and the consequent and assiduous care on the part of the Levee Board, the planters, as well as all interested parties behind these levees, there was no disaster.

*The Grand Prairie Levee District* comprises the alluvial lands on the east bank of the Mississippi river, contained within the Parish of Plaquemines, from the lower line of Bohemia plantation to the lower line of Baptiste Collette Gap, requiring a levee of 33.30 miles fronting the Mississippi river. There are 29.34 miles of continuous levee extending from the upper boundary of the district to one mile below the settlement of New Canal. Below this, there are small areas, or settlements, which are enclosed by levees and cultivated. The levees along the river front of this district also protect a very large, important and growing oyster culture bordering on the marsh lands in the rear. The tax on the product of this industry is one of the most valuable resources in the district for levee purposes.

The assessed valuation of the district, on the tax rolls of 1903, was $182, 886.

There are five commissioners in the district.

The domicile of the Board is at Pointe-a-la-Hache, Plaquemines Parish, La.

The amount and cost of the work done in the district during the past two years by the district, the state and the United States, is as follows:

| WORK DONE | Miles of New Levee Built. | Miles of Levee Raised and Enlarged. | Cubic Yards of Earthwork. | COST. |
|---|---|---|---|---|
| By the District | 2.66 | 0.14 | 32,789 | $ 3,793.31 |
| By the State | 4.46 | 3.14 | 109,956 | 15,019.90 |
| By the United States | 1.09 | ...... | 43,633 | 7,708.55 |
| Totals | 8.21 | 3.28 | 186,378 | $ 26,521.76 |

In addition to the above the district has expended $8,402.58 on minor repairs to its levees, such as keeping the line free from weeds, cutting out crayfish holes, musk rat holes, construction of wooden revetments and the cleaning of drainage ditches.

The high water of 1903 was from over one foot at the upper end of the district to eight-tenths of a foot at the lower end of the district higher than that of the highest previous water of 1897.

This district was created by Act No. 24 of 1898. The flood of 1897, previous to its organization, having breached and destroyed the levees in many places, and overflowed the territory to such an extent as to materially affect its resources, it was unable for lack of funds, in the *interim* of the floods of 1897 and 1903, to do more than build, enlarge and repair the levee line on the river front, and that only to a grade of about one to one and one-half feet above the high water plane of 1897, with crown four feet and slopes two and three to one.

The levees were overtopped by the high water of 1903 and had to be raised for over five miles. Besides this they were subjected to an earlier and longer period of high water than any other district in the state, except the Buras Levee District. The high water of 1897 was reached as early as March 5th, and by March 21st it reached its culminating point.

It was found impossible with the means at hand to prevent some of this temporary work from being washed away in places by the waves, caused by the prevailing March winds, and also by the passing of large ocean steamers.

In consequence of this some parts of the line were breached. The aggregate width of crevasses was not more than three-fourths of a mile, and the area overflowed was mostly sea marsh and did not exceed sixteen square miles, about 1600 acres (2½ square miles) of which was tillable land adapted to rice culture, though but little, if any, of it had been prepared for sowing.

The greatest damage resulting from this overflow was to the oyster beds, which had been extensively planted in the bays and lagoons in the rear of the marsh lands.

*The Plaquemines Parish East Bank Levee District,* created by Act 7 of 1902, consists of "all the territory contained within the Parish of Plaquemines on the left or east bank of the Mississippi river, beginning at the upper line of Harlem plantation and extending to the lower line of H. H. Baker's Ostreka Farm at Old Quarantine Station." It is entirely included within the limits of the Lake Borgne Basin Levee District and the Grand Prairie Levee District; so that all parts of it are also parts of another levee district. In this respect, as well as in having been constituted "for the purpose of protecting the lands of said district from inundation from the waters of the Gulf of Mexico," the Plaquemines Parish East Bank Levee District differs from any of the levee districts of the state previously created.

The Act provides for the appointment of five levee commissioners and authorizes the issuance of bonds to the amount of $135,000; and as amended by Act 116 of 1902, the Board of Levee Commissioners is authorized to "provide for and cause to be made such openings in its levee line as will insure proper and adequate exit for the drainage water, and to provide for such devices at said drainage outlets as the Board may deem necessary to protect the district during storms or high water."

The domicile of the Board is at Pointe-a-la-Hache, Parish of Plaquemines, La.

In order to carry out the provisions of the act, the Board was organized on August 8th, 1902, and on August 23d, 1902, proposals were invited for building about 33 miles of Gulf Coast levee, containing about 1,350,000 cubic yards of earthwork, and divided into three sections as follows:

Section 1 (Harlem to Bohemia), about 12 miles, 500,000 cubic yards.

Section 2 (Bohemia to Harris Canal), about 11 miles, 450,000 cubic yards.

Section 3 (Harris Canal to Old Quarantine), about 10 miles, 400,000 cubic yards.

Also about the same time sealed proposals were invited for the construction and insertion of wooden sluices in the levee at specified intervals, and for the excavation of a drainage ditch in the rear of the fields parallel to said levee, all of which works were contemplated in the project.

The line of levee is located near the edge of the sea marsh, generally parallel with, and from half a mile to about a mile back from the Mississippi river, on ground less than a foot above Gulf level, and subject, therefore, to overflow from high tides as well as river water during the irrigation of the fields for rice culture. In consequence of these conditions the levee necessarily had to be built with a floating dredge.

A contract was entered into on October 16th, 1902, by the Board with Messrs. Dowdle & Windett for the construction of Sections 1, 2, and 3 at 9¼ cents per cubic yard, work to begin December 1, 1902, and completed June 1, 1904.

On October 10, 1902, a contract was entered into with Gustave Favrot, for the supply and placing in position of drainage sluices at prescribed intervals in the line of levee, at $78.00 per sluice, and in February, 1903, a contract was entered into with Chas. G.

Schayot for the excavation of a drainage ditch at $2.50 per 100 feet of ditch.

Considerable delay, on the part of the contractors for the earthwork, has occurred, owing to their misfortune in the loss of two out of three of their newly constructed floating dredges of the Menge patent designed especially for this work. One was sunk in Breton Island Sound in a rough sea whilst towing it around to "Riviere aux Chenes," and another "turned turtle," at its first trial in the Riviere aux Chenes. The third dredge was built on the ground, and began work on Section No. 1 on or about November 13, 1903.

Up to the date of this report there has been placed in position on this work some 173,155 cubic yards of earthwork in Section 1, at a cost to the district of $16,016.84.

No earthwork has been done in Sections 2 and 3. The Board, within the same time has paid for twenty-nine drainage sluices at a cost of $2,262.00, and has excavated 96,235 linear feet of drainage ditch at a cost of $2,405.87.

*The Buras Levee District* comprises the alluvial lands on the west bank of the Mississippi river "in the Parish of Plaquemines, south of a line drawn from the lower line of Riceland plantation to the limits of Harang Canal on Bayou Lafourche," extending to the Jump, and requiring a levee line of 33.76 miles fronting the Mississippi river.

The assessed valuation of the district, on the tax rolls of 1903, was $439.112.

There are five commissioners in the district.

The domicile of the Board is at Buras, Parish of Plaquemines, La.

The amount and cost of the work done in the district during the past two years by the state and the United States is as follows:

| WORK DONE | Miles of New Levee Built | Miles of Levee Raised and Enlarged | Cubic Yards of Earthwork | COST |
|---|---|---|---|---|
| By the State.......... ............ | 1.28 | 0.97 | 58,283 | $10,216.51 |
| By the United States............. | 0.48 | ...... | 17,120 | 2,824.79 |
| Totals......................... | 1.76 | 0.97 | 75,403 | $13,041.30 |

| | |
|---|---|
| In addition to this the district has expended for the construction of wooden revetments and other protection work | $10,597 |
| For repair work, weed cutting | 6,038 |
| For high water protection work, 1902 | 457 |
| For high water protection work, 1903 | 4,857 |

The high water of 1903 was from over one foot at the upper end of the district to 0.8 of a foot at the lower end of the district higher than that of the highest previous water, 1897, and the levees were subjected to a greater strain than ever before, but owing to the improved condition of the levee line, and the constant and assiduous care on the part of the Levee Board, there was no disaster to the levees in the district.

*The Caddo Levee District.* All alluvial land, and all lands subject to or that are liable to overflow from the waters of Red river, or its tributaries, or its outlets, situated in the Parish of Caddo, not including such lands as occur within the corporate limits of the City of Shreveport, are embraced within the boundaries of this district.

The assessed valuation of the district, on the tax rolls of 1903, was $1,156.270.

The affairs of the district are conducted by a board of seven commissioners, appointed by the Governor.

The domicile of the board is at Shreveport, La.

The continuous length of public levee upon which the district is now dependent for protection, is as follows:

1. *Above Shreveport*—From Blanton's Bluff, Ark., to Gold Point, La., 45 miles. The length of river front between these limits, however, is about 54 miles.

2. *Below Shreveport*—From the bluffs on the north bank of Bayou Pierre to the lower line of Caddo parish, about 35 miles, with a length of river front within these limits of about 52 miles.

Owing to the closure of Tones Bayou, the nine miles of levee on Bayou Pierre upon which that part of the district lying below Tones Bayou was formerly largely dependent for protection, is not herein included in the 35 miles now regarded as constituting the main public levee line in the lower Caddo system.

The length of the unleveed part of the district, extending from Eric's Point to Shreveport, referred to in the last biennial report of the Board of State Engineers, has been reduced from 21 miles by river at that time, to about 17 miles by river at the present time, by the extension of the line from Eric's Point to Gold Point.

The levee work done in the district during the past two years is as follows:

By the District—New levee, 10.50 miles; enlargement, 3.56 miles, amounting to 831,773 cubic yards, costing $132,077.66.

By the State—New levee, 2.72 miles; enlargement, 0.02 miles, amounting to 213,025 cubic yards, costing $40,994.71.

This represents a total of 13.22 miles of new levee, and 3.58 miles of enlargement, and 1,044,798 cubic yards of earthwork, costing $173,072.37.

All of this work has been completed.

The district also expended a considerable sum, in protection and emergency work rendered necessary during high water, in weed cutting, etc., and in ordinary repair work not measurable in cubic yards.

The general condition of the lines of public levee in the Caddo Levee District is good, though complaint has still to be recorded of abuses to which it is subjected here and there.

The district was, during the period covered by this report, visited by two high waters of considerable proportions, following one another at a short interval. The first culminated at Shreveport on December 16, 1902, its stage on that date reading 34.1, and reaching on many stretches of the river, in the district, stages of from one foot to two and a half feet above any waters of previous record.

The second flood, culminating at Shreveport on March 23, 1903, at a stage there but one foot lower than that of the first flood, failed to develop stages at other points as high comparatively as those developed on the first flood.

Notwithstanding these high stages of water in Red river, the duration of which was longer than usual, the levee lines in the Caddo Levee District proved equal to the service devolving upon them, except at Thompson's, about 50 miles above Shreveport. Here a serious breach in the line occurred on the first flood which remained open during both floods, but has since been substantially closed.

The grade of the levees in the Caddo Levee District was found materially deficient during the first flood in only four localities; at the head of Simpson's Lake, a government levee, due to the excessive shrinkage and settlement; at Hurrican Bluff plantation, built by riparian owners, to smaller dimensions than those prescribed for district and state levees; and at Ashwood and Pascagoula plantations, built by the district in the early days of its existence, before means were available for building the levees to the more ample proportions now observed.

The levees at all of the localities above described have been raised and enlarged to compare favorably with the balance of the line.

Except for caving banks, both floods would have passed down Red river without serious cause for apprehension to any one in the Caddo Levee District.

Owing to the rapid enlargement of the section of Red river, along the front of the Caddo Levee District, resulting from the more successful confinement of its waters to the main stream, by means of levees, than in its past history, the natural tortuousness of the stream, opposing numerous concave bends to the energy of the current, and the serious disturbance of its regimen by a number of cut-offs which occurred during the high water, notably in the vicinity of Pandora, Hogs Skin Point, Magnolia, and Lovely Point, caving banks have been even more general and serious on this part of Red river within the last year than those usually following the ordinary course of events.

So serious and rapid was the caving at White Hall, Campo Bello and Cross Keys, during the high water described, that the existing levees there, though considered at a safe distance from the river bank, previous to high water (at White Hall, the distance was about 400 feet), were breached, and a general and disastrous overflow in the lower part of the district averted only by the strenuous and successful efforts of the levee authorities, riparian proprietors, and others, in constructing and maintaining in the face of the rising waters a series of extensive run-rounds.

To caving banks is, therefore, due the large amount of levee work shown to have been required in new levees in the district within the period covered by this report. The same influences must necessarily continue for an indefinite period, and will call for further considerable provision for new levees from time to time.

Attention is called to certain special reports to the Board of Commissioners of the Caddo Levee District, appearing in the Appendix B.

*The Bossier Levee District.* All alluvial lands subject to or liable to overflow from the waters of Red river or its tributaries or outlets, in the Parish of Bossier, south of the line dividing the north half from the south half of township 20 north, are embraced within the boundaries of this district.

The assessed valuation of the district, on the tax rolls of 1903, was $1,428,223.

The affairs of the district are conducted by a board of seven commissioners appointed by the Governor.

The public levee line protecting the district extends at this time continuously from its upper limits, at the foot of Hurricane Bluff to the Dennison plantation, within 5 miles, by river, of the lower limits of the district, a length of line aggregating about 58 miles, the length of the river front, between the same limits, being about 79 miles.

Along the unleveed distance, at the lower end of the district, the banks of Red river are somewhat higher than most of the high waters which have visited the river in the past, and the district has wisely deferred the extension of its system over it until the more urgent work above would justly permit.

Two outlets, however, of considerable proportions, depart from Red river in this stretch, Ninock bayou and Swift Chute bayou, and at times permitted the river to back up through them on to considerable valuable territory at the lower end of the district, against which considerable complaint has locally been made since the last high water in Red river.

To comply with the wishes of the community affected, and remedy the evil complained of, the Board of Commissioners have recently let out contracts to close these bayous, but will defer connecting the embankment closing them, and these with the general system above, until the necessity for it is more fully demonstrated.

The levee work done in the district during the past two years, is as follows:

By the District—New levee, 6.17 miles, amounting to 498,425 cubic yards, costing $87,733.80.

By the State—New levee, 3.55 miles; enlargement, 1.00 miles, amounting to 392,734 cubic yards, costing $61,813.95.

This represents a total of 9.72 miles of new levee, and 10.04 miles of enlargement, and 890,799 cubic yards of earthwork, costing $149,547.75.

All this work, with the exception of that at Swift Chute bayou, has been completed.

The district has also expended a considerable sum in protection and emergency work rendered necessary during high water, in weed cutting, etc., and in repair work not measurable in cubic yards.

Except for some wear, here and there, and certain abuses to which they continue, from time to time, to be subjected in localities, the condition of the lines of public levees in the Bossier Levee District is good.

As the Bossier Levee District front occupies, within its upper and lower limits, the east bank of Red river, directly opposite the Caddo Levee District, the recital of the high water experiences of the one, during 1902 and 1903, must necesarily be but a repetition of that of the other as already given.

The grade of the entire line of levees in this district stood well above the two floods already described, except in one locality, at Ash Point, about 23 miles below Shreveport, by river. Here a short stretch of topping was found necessary. A new levee extending from Phillip's to Mercer's covering this low stretch, as well as the caving bank extending along it, has since been completed by the district.

The same causes which precipitated so much caving in so many of the concave bends of the river, on the Caddo Levee District side, were also at work on the Bossier Levee District side of the river, and at Willow Chute, Gold Dust, Hopewell, Christiana and Buckhorn, the lines of levee were breached in spots, almost from day to day, by caving banks, during the highest stages reached by the river. Extensive run-rounds, however, were hastily thrown up at these places, from time to time, to cover the breaches as the exigencies arose, and by almost superhuman efforts put forth by the levee authorities, the riparian proprietors, the Shreveport and Red River Valley Railway Company and others, both floods were controlled throughout the length of the district and carried pass it without overflow or material damage.

New lines of levee have, during the past season, been constructed by the district, or the state, at all the places named, as well as at several others where caving banks threatened to encroach upon the existing lines, and the line as a whole is at this time again in a comparatively safe and assuring condition.

Attention is called to certain special reports to the Board of Commissioners of the Bossier Levee District, appearing, in Appendix B.

*The Red River, Atchafalaya and Bayou Boeuf Levee District.* All lands subject to overflow in the parishes of Rapides and Avoyelles, and that part of the parish of St. Landry situated between the Atchafalaya river on the east, and Bayou Bœuf and Courtableau on the west and south, are subject to the operations of the original act of incorporation of this district.

All that section of Rapides parish above Alexandria, bounded by bayous Rapides, Jean de Jean, and Red River, and all parts of the parish situated on the left bank of Red River, also all portions of the parish of Avoyelles situated on the left bank of Red River, as well as that part of the parish bounded by Bayou des Glaizes, the Atchafalaya and Red Rivers, and the public road running from David's Ferry on Red river to Bayou des Glaizes, by way of Marksville, Mansura and the "Long Bridge," at Bout du Bayou, have been exempted from the operations of the original act of incorporation of the district.

The assessed valuation of the district, as now constituted, on the tax rolls of 1903, was $4,222,905.

The affairs of the district are administered by a Board of three Commissioners, appointed by the Governor, one from each of the parishes composing the district.

The work done in the district during the past two years is as follows: By the District—Levee Work: New Levee, 0.91 miles; enlargement, 4.26 miles; amounting to 237,676 cubic yards; costing $49,582.93. Drainage Work: Clearing, 22.54 miles, costing $25,559.20; excavation, 30.01 miles, amounting to 890,287 cubic yards, and costing $82,692.16. By the State—Levee Work: New levee, 0.08 miles; enlargement, 9.18 miles; amounting to 226,888 cubic yards; costing $43,981.75.

This represents a total of 0.99 miles of new levee, 13.44 miles of enlargement; amounting to 464,564 cubic yards, costing $93,564.68; and 30.01 miles of drainage work, amounting to 22.54 miles of clearing, and 890,287 cubic yards of excavation, costing $108,251.36, or a total expenditure for work in the district done by contract of $200,816.04.

The district also expended $3,309.05 in protection and emergency work rendered necessary during high water, in weed cutting, etc., and in ordinary repair work not measurable in cubic yards.

The lines of continuous public levee in the district, as well as their general efficiency, remain practically the same as reported in the biennial report of the Board of State Engineers preceding this.

The only extension to the levee line of the district attempted during the period covered by this report was on the Atchafalaya River below Melville. This work was, however, unfortunately not finished at the time of the advent of the high water of 1903, and, being at the lower end of the system, where the high water must naturally escape around it with great force to the low-lying territory behind, a large part of the work done was thereby lost. Work on this extension was resumed about March 1st last, and is still in progress.

No serious stage of water was reached in any of the streams affecting this district, during the period covered by this report, until the spring of 1903. During this time, however, very high stages prevailed in all the streams affecting the district, as follows:

*On Red River*: At Alexandria the water, on March 27, 1903, reached a stage of 36.2 on the gauge, that is, within 2 feet of that of 1892, the highest water of record at that point; from Alexandria to Egg Bend, this difference gradually diminished to a stage about equal to that of 1892; from Egg Bend to David's Ferry, the high water of 1892 was gradually exceeded until at David's Ferry it was about a half a foot higher; at its mouth, Red River was somewhat lower than the high water of 1897, the highest of record there.

*On Bayou des Glaizes*: The high water of 1903 reached a stage within three quarters of a foot of that 1897 at Moreauville, and within one-quarter of a foot of that of 1897 at Simmsport, where the high water of 1897 was the highest of record by about two and one-half feet.

*On the Atchafalaya River*: The high water of 1903 varied from a height about a quarter of a foot below 1897 at Simmsport, to a height 1.7 higher than 1882, the highest of record, at Melville, or 38.7 on the gauge there, on April 4th, 1903, as compared with 37.0 on May 16th-19th, 1882.

Notwithstanding this high stage of water against the long lines of levee in the district, extending over a period of four months, the district was at no time during this period given any serious cause for apprehension for its safety from overflow.

Besides the work of levee building and enlargement to protect the district from overflow, from the high waters prevailing from time to time in the streams bordering and traversing it, the district, under authority given it by law, has, during the past two years, continued a system of drainage to relieve certain areas from overflow from rainwater, where natural drains have been interrupted by reason of the extension of the lines of public levee across natural channels, previously affording relief during periods of low water in the main streams.

In this way, the district has, during the past two years, completed a line of work for improving drainage from Alexandria to Chatlin's Lake, and from Mill Bayou to Turner's Bayou, and still has under contract work for improving drainage from Chatlin's Lake to Three Prong Lake, from Three Prong Lake to Bayou des Glaizes, from Turner's Bayou to Bayou Jack, involving an expenditure of about $259,043.68.

As an adjunct to the project for improving drainage from Alexandria to Bayou des Glaizes, the district, upon the recommendation of the Board of State Engineers, closed Bayou Lamourie, at the point of its departure from Bayou Bœuf, by a dam, supplemented by a siphon over it to furnish running water for domestic purposes to the inhabitants dwelling along the banks of Bayou Lamourie, and for watering stock.

Through the intemperate and lawless action of a number of unknown parties, this dam was destroyed on the night of May 10, 1903. A resume of the reasons for building this dam, and a history of its effect upon the situation up to the time of its destruction is given in Appendix B.

The Red River, Atchafalaya and Bayou Bœuf Levee District also essayed certain other work in the district, during the past year, which was somewhat of a departure from the usual order of things for a levee organization. Considerable uneasiness had, for quite a while been felt by the City of Alexandria and country below in regard to the condition of a part of the front of the city, at the lower end of the reach extending from Bayou Rapides to Beauregard Street, which had been revetted some years back by the National Government.

At the lower end of this protection work, the slope of the river bank had been gradually growing steeper for some years past, until there was reason to believe that, though not strictly a caving bank, it might slip or cave off to a greater or less extent, and possibly carry a part of the levee line with it.

The levee line here, upon which Alexandria, and the district below is dependent for protection, is rather close to the river bank, and any recession of the latter would be a source of more or less anxiety to all concerned.

To move the levee back would involve the sacrifice of valuable property, which it was desirable, if possible, to avoid.

It was, therefore, suggested that the City of Alexandria, the Parish of Rapides, and the Red River, Atchafalaya and Bayou Bœuf Levee District, all directly concerned and interested in the situation, might jointly contribute to undertake some system of protection for the river bank at the locality in question.

This suggestion was finally favorably considered by the three authorities named, and an agreement upon that basis arrived at, by which the cost of the protection work necessary might be jointly met by them, the plans and specifications for the project to be approved by the Board of State Engineers.

Under this agreement some 34,000 square feet of timber mattress work, weighted with stone, was placed in position, and the foot of the slope graded and protected with loose rock, at the exposed point, at a cost of $3,649.72.

The result so far is very assuring.

Attention is called to certain special reports to the Board of Commissioners of the Red River, Atchafalaya and Bayou Bœuf Levee District, appearing in Appendix B.

*The Courtableau Levee District*, in the Parish of St. Landry, was created by Act 166 of 1902. It comprises an area of about 76 square miles, south of aByou Courtableau and east of the "back lines of grants on the Teche." The Act provides for the appointment of three levee Commissioners and authorizes the issuance of bonds to the amount of $40,000.

It was estimated that a line of levees on the banks of Bayou Courtableau and the Atchafalaya, as contemplated in the Act creating the district, would cost not less than $140,000. In view of the limited area of the district, the small amount of revenue it could supply, and of the fact that high water in the Atchafalaya would pass around the lower end of a levee and overflow a considerable part of it with "back water," it was wisely concluded by the levee commissioners, at their meeting of October 2nd, 1902, to take no immediate action for undertaking levee work.

If this district could join with the Red River, Atchafalaya and Bayou Bœuf Levee District in closing Bayou Courtableau, and thence extend its levee line down the Atchafalaya, the same degree of protection might be secured, and the cost of a levee line along Bayou Courtableau, estimated at as much as $90,000, might be saved.

## STAGE OF THE RIVERS.

During the spring of 1903, the Mississippi River, at most of the stations where its stages, from Arkansas City south, have been recorded, established for itself a new record for the high water, as shown by the following table:

| LOCALITY. | 1903.<br>ft. | 1897.<br>ft. | Difference.<br>ft. |
|---|---|---|---|
| Arkansas City, Ark | 53.0 | 51.9 | 1.1 above |
| Greenville, Miss. | 49.1 | 46.75 | 2.35 above |
| Lake Providence, La | 46.4 | 44.54 | 1.86 above |
| Vicksburg, Miss. | 51.8 | 52.48 | 0.68 below |
| St. Joseph, La. | 48.0 | 47.58 | 0.42 above |
| Natchez, Miss. | 50.4 | 49.82 | 0.58 above |
| Red River Landing, La. | 50.0 | 50.20 | 0.2 below |
| Baton Rouge, La. | 40.0 | 40.65 | 0.65 below |
| Donaldsonville, La. | 32.2 | 32.75 | 0.55 below |
| Carrollton, La. | 19.4 | 19.17 | 0.23 above |
| Fort Jackson, La. | 8.1 | 7.2 | 0.9 above |

On Red River, while the highest stages recorded, during this time, at Fulton, Shreveport, Alexandria, and Red River Landing, were more or less lower than those of the highest previous record, at a number of intermediate points, by reason of adjustment of slope and other local causes, stages were reached greatly exceeding those of previous record, as much, at points as two and one-half feet.

On Bayou des Gaizes, the high water of 1903 did not exceed the highest of previous record, whihc, at Moreauville, occurred in 1882, and at Simmsport, in 1897, though closely approximated at both points.

On the Atchafalaya River, the highest water of previous record (1897) was reached within about two-tenths of a foot at Simmsport and gradually exceeded below there, until, at Melville, the high water of 1903 was 1.7 feet higher than ever before (1882).

On Bayou Lafourche, the flood of 1903, though failing to reach a stage equal to that of previous record at Donaldsonville, by about six-tenths of a foot, developed, previous to the breaks which occurred in its levee line on the right bank, higher stages than ever before, on all parts of the bayou from 25 to 50 miles below its head.

Notwithstanding these very high stages of water, but seven crevasses producing any general effect are to be recorded in the State in 1903, as follows: On the Mississippi River, three (Hollybrook, Hymelia, and Magnolia, the latter being promptly closed); on Red River, one (Thompson's); on Bayou Lafourche, three (Falgout's, Guidry, and Howell's), the aggregate width of all of which did not exceed one mile.

In the Grand Priarie Levee District, the lower end of the levee system on the left bank of the Mississippi River, there were, however, several small breaks of local effect, aggregating about three-quarters of a mile in width.

At this date, April 20, 1904, the stages of the upper rivers show no indication of any flood this season, sufficient, with the generally improved condition of the levee system of the State, to cause anxiety or alarm.

### BAYOU LAFOURCHE.

Act No. 9 of the Legislative Session of 1900, taking cognizance of the physical conditions prevailing on Bayou Lafourche, which made it impracticable to protect the lands adjoining it from overflow, authorized the Atchafalaya Basin and Lafourche Levee Boards to close Bayou Lafourche by a lock so as to divorce it from the Mississippi River, and thereby exclude from it the flood waves which resulted annually in breaches in its levee lines, and more or less general overflow. Act No. 9 required the approval of the Congress of the United States to the project.

The Rivers and Harbors Bill of the United States Congress, known as Public Document No. 154, approved June 13, 1902, authorized the construction of said locks and a temporary dam to protect them during construction, provided certain additional sanction was obtained from the Legislature of the State of Louisiana.

Act No. 84 of the Legislative Session of the State of Louisiana of 1902, granted the authority required by the Act of Congress, authorized the construction of a temporary dam at Donaldsonville to enable the construction of the locks, required the maintenance of a fresh water channel in Bayou Lafourche to be not less than six feet deep by sixty feet wide, and gave to the Levee Boards authorization and power to do all things necessary to carry out the purposes of the law.

The Atchafalaya Basin and Lafourche Levee Boards at once began work and requested the Board of State Engineers to submit to them plans and specifications to carry out the project. On October 10, 1902, the Board of State Engineers, in a detailed report to the levee boards, which appears in Appendix B, outlined the work necessary to be done under this project.

The Levee Boards were about to proceed in accordance with this report, when, on January 10, 1903, they were enjoined from any and all work under said project by certain property holders on Bayou Lafourche opposed to the project. The case was taken up by the local courts, and then, by the Supreme Court of the State of Louisiana, and on June 30, 1903, a final decision was rendered authorizing the Levee Boards to proceed with the work.

On October 10, 1903, the Levee Boards entered into contract to dredge Bayou Lafourche to the depth required by law, and to construct the Lake Bœuf Canal, which taps the drainage basin of an area covering 425 square miles, the purpose of which was to partly divert the drainage of this area from Lake des Allmands to Bayou Lafourche, thereby acting as a supply of fresh water.

On November 12, 1903, the construction of the dam was begun at Donaldsonville, and on December 10, 1903, Bayou Lafourche was cut off by an earthen embankment from the Mississippi River. When Bayou Lafourche was divorced from the Mississippi River the water in it fell to the level of the Gulf of Mexico, into which the bayou empties. Soundings taken at this time showed that the bed of the Bayou consisted of a series of bars and pools, the crest of a few bars being about one foot below the level of the Gulf, and the pools varying from 5 feet to 14 feet below the level of the Gulf. The Levee Boards devoted their efforts to cutting out the crest of these bars with dredges, and at the present day there remains about 3½ miles of bars which are being cut as rapidly as possible by two dredges. When these dredge boats meet there will, at no place, be a depth of water in Bayou Lafourche less than 3½ feet above the highest bars, and of generally 6 feet or more throughout the stream. The dredges will then be put to work cutting the bars over which there is only 3½ feet, so as to bring the whole bayou to a six-foot depth as rapidly as possible.

In addition to this, parties owning private canals which communicate with Lake Salvador have requested permission of the Levee Boards to open these canals into Bayou Lafourche. The Levee Boards have given this permission, surrounding it with the safeguards necessary to exclude salt water from Bayou Lafourche, should it show a disposition to enter through these canals.

The result is that at the time of this report one of these canals is probably open into Bayou Lafourche, connecting it by water with Lake Salvador, which in turn connects with Company and Harvey's Canals. Company Canal is connected by locks with the Mississippi River, and a lock is being built at Harvey's Canal, which will be completed in six months, and which will open this canal into the Mississippi River. The result is that an all-water route is being established from the City of New Orleans, through Company Canal, Lake Salvador, Harang Canal and Bayou Lafourche, which will give water transportation all of the year on that stream, a condition which never has existed in the past owing to the many shoal bars which existed in Bayou Lafourche during the low water periods of the past. This all-water route, which, at the present, will have a depth of 3½ feet of water over the shoalest bars, will very shortly be made a route six feet deep.

Owing to the delay from litigation and causes over which the Levee Boards had no control, it became necessary for them to ask Congress to extend the time fixed for the completion of the locks at Donaldsonville. Congress has passed a special Act authorizing this extension of time, so that the work bids fair to progress now without further interruption.

The Levee Boards are considering additional plans for the supply of fresh water to Bayou Lafourche, some of which involve the erection of pumps at Donaldsonville, to suply the five 18-inch siphons which have been placed over the dam. These siphons will run of their own accord at the medium and high stages of the Mississippi River and at the low stages of the river they can be supplied by a pumping plant, the cost of which would be moderate compared to the benefits derived.

The result of the project is that at this date there is no high water in Bayou Lafourche, while in the past, disastrous crevasses occurred as a result of excessive high floods on Bayou Lafourche, when the height of the Mississippi River was even less than it is at the date of this writing.

## NEW BASIN CANAL AND SHELL ROAD.

During the last two years, the Board of Control of the New Basin Canal and Shell Road has, to the full extent of the means at its disposal, continued the improvement of the State property confided to its care. It has undertaken the construction of 10,300 feet of revetment, covering the stretch from Magnolia Bridge to Carrollton Avenue. This revetment of the west bank of the canal was rendered necessary by the sloughing of the bank into the canal, resulting in its encroachment upon the road bordering the canal. The revetment has been designed on the same lines as that previously built on other parts of the canal, and of this 7,000 feet is already constructed. The balance of the work will be completed within the next sixty days, when the entire west bank of the canal, from its head at Rampart Street, to its mouth at Lake Pontchartrain, will be continuously revetted. For 5,000 feet the space between the revetment and the road has already been refilled by dredging, thereby widening and restoring to efficient condition the roadway bordering the canal.

In addition to this the Board has dredged the east bank of the canal between Carrollton Avenue and the Mississippi Valley R. R. Bridge, to a depth of 12 feet.

The Board of State Engineers prepared for the Board of Control of the New Basin Canal and Shell Road plans and specifications for the extension, and rectification of the west jetty at West End. The undertaking of this work, in contemplation by the Board of Control, has been postponed until the completion of the revetment, which has consumed all of the means at its disposal at this time.

In addition to this, several engineering questions were submitted to this Board by the Board of Control, the most important of which was the location of the crossing of the canal by the Louisiana Railways and Navigation Company, and the running of the line of the said railroad on the east bank of the canal. Also the construction of draw bridges by the said railway company, and by the New Orleans Railways Company over the canal, which resulted in the adoption of long span draw bridges to be operated by power instead of by hand, as has been done in the past, so that the navigation of the canal might be facilitated thereby.

The New Basin Canal property has steadily improved in the last two years, and greater facilties have been offered to the traffic plying on it. The result is apparent from the increase of tonnage entering the canal and the revenues of the Board of Control.

### SURVEYS OF STATE LANDS.

Under several Acts of the Legislature of 1902 (Nos. 123, 124 and 171), it is provided that the Governor may direct the Board of State Engineers to make surveys and sub-divisions necessary for identification, description, entry and sale of unsurveyed lands of the State. But as no appropriation was made for the expenses of the work, the only surveys under these Acts thus far undertaken have been, with one exception, such as parties in interest have arranged to have made without cost to the State.

Land surveying—especially the surveying of public lands—is a distinct art, and of course, should be done with better skill and judgment by surveyors who make it their regular business, and have local knowledge of land lines and corners in their own neighborhood than by others; and hence the Parish Surveyors throughout the State are probably better qualified to make these surveys than anyone else.

It is to be expected that there will soon be a very large amount of such work required in the State—enough to keep the Parish Surveyors, and others also, occupied in many parishes for years to come.

There is no apparent necessity nor any sufficient reason for putting these surveys in charge of the Board of State Engineers. It would seem reasonable that they might be made to the best advantage of the State through the direct administration of the State Land Office; though whatever department may be put in charge of them, it is probable that the only practicable method of getting the work properly done will generally be by retaining the services of the Parish Surveyors, or other surveyors in the vicinity of the work required.

It is, therefore, respectfully suggested that the Legislature be recommended to so amend the several Acts above referred to as to put the land surveys of the State in charge of the Register of the State Land Office, and that sufficient appropriation be made for the work that may be required.

## APPENDICES.

A number of tabular statements showing details of the levee work of the past two years, and other statistics are presented herewith, as also copies of sundry special reports and letters relative to matters deemed of public interest. Though they are not in all cases referred to in the text of the Report, they are submitted as a part thereof, in the following appendices, viz:

Appendix A—Tabular statements relative to quantity, length and cost of levee work undertaken by the State of Louisiana, the several Boards of Levee Commissioners, and the United States, in Louisiana and a part of Arkansas, from April 21, 1902, to April 20, 1904.

Appendix B—Copies of sundry special reports, letters, etc., from the Board of State Engineers to the various Levee Boards and Commissioners, and to others. Also statements relative to resources of the levee Districts and State for levee purposes, and relative to length of levee lines, and high water records.

In conclusion, the Board of State Engineers wishes to record the fact that though Henry B. Richardson's name does not appear among the signatures to this Report, owing to his having recently severed his connection with this department, it has, nevertheless, been largely prepared under his direction and supervision.

All of which is respectfully submitted,

| | |
|---|---|
| *The Board of State Engineers,* | FRANK M. KERR,<br>*Chief State Engineer,*<br>SIDNEY F. LEWIS,<br>ARSENE PERRILLIAT,<br>M. P. ROBERTSON,<br>GERVAIS LOMBARD,<br>*Assistant State Engineers.* |

WALTER H. HOFFMAN,
*Secretary.*

# APPENDIX A.

## TABULAR STATEMENTS RELATIVE TO QUANTITY, LENGTH AND COST OF LEVEE WORK UNDERTAKEN BY THE STATE OF LOUISIANA, THE SEVERAL BOARDS OF LEVEE COMMISSIONERS, AND THE UNITED STATES, IN LOUISIANA AND A PART OF ARKANSAS, FROM APRIL, 21, 1902 TO APRIL 20, 1904.

NOTE:—The number of cubic yards given in the following statements for work done by the levee districts is based upon the list of dimensions furnished and estimates made by the Board of State Engineers for the levees named, and the cost is obtained by applying the price per cubic yard bid for the work, without regard to discount, interest, or other incidental expenses incurred by the Levee Commissioners.

APPENDIX A. STATEMENT

Levee work undertaken by the State of Louisiana in the several Levee to April 20, 1904, with seven contracts of earlier

| Number | NAME OF CONTRACT | PARISH | DATE OF | | LINEAR FEET | |
|---|---|---|---|---|---|---|
| | | | Contract | Final Certificate | New Levee | Enlargement |
| | | | FIFTH LOUISIANA LEVEE | | | |
| 1 | Opossum Pt. to Wilson Pt.. | E. Carroll..... | Aug. 5, 1903 | Nov. 12, 1993 | .......... | 5,885 |
| 2 | Wilson Pt.............. ... | E. Carroll..... | Sep. 10, 1903 | Mch. 28, 1904 | .......... | 5,835 |
| 3 | Donna Vista.............. | E. Carroll..... | Sep. 10, 1901 | Sep. 27, 1902 | .......... | 6,300 |
| 4 | Longwood ................ | E. Carroll..... | Sep. 10, 1903 | ............ | .......... | 7,400 |
| 5 | Elton...................... | E. Carroll..... | Sep. 10, 1903 | ............ | .......... | 16,279 |
| 6 | Alsatia.................... | E. Carroll..... | Nov. 19, 1901 | Nov. 3, 1902 | .......... | 10,450 |
| 7 | Cabin Teele............... | Madison ...... | Sep. 10, 9011 | May 26, 1902 | 3,337 | 4,225 |
| 8 | Killarney.................. | Madison ...... | Jan. 15, 1900 | Jan. 5, 1903 | 8,675 | .......... |
| 9 | Lower Concordia.......... | Concordia .... | Nov. 25, 9021 | Apl. 9, 1904 | 46,370 | .......... |
| | Totals ........... | .................. | ............ | ............ | 58,382 | 56,374 |
| | Less amount done previous | to April 21, 1902.. | ............ | ............ | 3,337 | 6,027 |
| | Work done from April 21, | 1902, to April 20, | 1904........ | ............ | 55,045<br>or 10.42 mi | 50,347<br>or 9.53 mi. |

Districts, under thirty-seven contracts entered into from April 21, 1902, date, not completed April 21, 1902.

| Cubic Yards | Price—Cents | Cost | STREAM | REMARKS |
|---|---|---|---|---|
| DISTRICT. | | | | |
| 9,050 | 40. | 3,620 .. | Mississippi Riv | |
| 54,700 | 18.9 | 10,338 30 | Mississippi Riv | |
| 42,608 | 12.48 | 5,317 47 | Mississippi Riv | |
| 38,000 | 19.9 | 7,562 00 | Mississippi Riv | |
| 106,000 | 21.98 | 23,298 80 | Mississippi Riv | |
| 64,135 | 22. | 14,109 70 | Mississippi Riv | |
| 60,387 | 11.97 | 7,228 32 | Mississippi Riv | |
| 200,170 | 12.19 | 24,400 72 | Mississippi Riv | |
| 351,590 | 11.7 | 41,136 03 | Mississippi Riv | |
| 926,640 | ...... | 137,011 34 | | |
| 99,193 | ...... | 13,242 33 | | |
| 827,447 | ...... | 123,769 01 | | |
| .......... | ...... | .......... | .................. | Average price 14.95 cents per cubic yard |

APPENDIX A. STATEMENT

| Number | NAME OF CONTRACT | PARISH | DATE OF Contract | DATE OF Final Certificate | LINEAR FEET New Levee | LINEAR FEET Enlargement |
|---|---|---|---|---|---|---|
| | | | ATCHAFALAYA BASIN LEVEE | | | |
| 10 | Fannie Richie............ | Pt. Coupee.... | July 15, 1902 | June 3, 1902 | .......... | 3,141 |
| | Claiborne to Dairies Sec. | .................. | ............ | ............ | .......... | 1,501 |
| 11 | Lakeland.................. | Pt. Coupee.... | Jan. 14, 1903 | ............ | .......... | .......... |
| | Enlargement............ | .................. | ............ | ............ | .......... | 21,136 |
| | Irwin.................... | .................. | ............ | ............ | 2,266 | .......... |
| | Taylor.................. | .................. | ............ | ............ | 927 | .......... |
| | Chapman ... ............ | .................. | ............ | ............ | 587 | .......... |
| 12 | Belmont to Viola.......... | W. Baton R'ge | Jan. 15, 1902 | July 14, 1903 | .......... | 11,490 |
| | Totals.............. | .................. | ............ | ............ | 3,780 | 37,268 |
| | Less work done previous to | April 20, 1902.... | ............ | ............ | .......... | 11,006 |
| | Work done from April 21, | 1902, to April 20, | 1904........ | ............ | 3,780<br>or 0.72 mls | 26,262<br>or 4.97 mls. |
| | | | PONTCHATRAIN LEVEE | | | |
| 13 | Arlington................ | E. Baton R'uge | May 16, 1902 | Dec. 5, 1903 | 6,125<br>or 1.16 mls | .......... |
| | | | LAFOURCHE BASIN LEVEE | | | |
| 14 | Starlight to Fairfield..... | Jefferson ..... | Oct. 12, 1903 | Mar. 31, 1904 | .......... | 14,668 |
| | Westwego............... | | ............ | ............ | .......... | 3,310 |
| | Ames..................... | | ............ | ............ | .......... | 5,587 |
| 15 | Beauregard.............. | Jefferson ..... | Aug. 5, 1903 | Oct. 1, 1903 | .......... | 2,920 |
| 16 | Magnolia................. | Plaquemines .. | Aug. 4, 1903 | Jan. 20, 1904 | 2,514 | .......... |
| | Totals.............. | .................. | ............ | ............ | 2,514<br>or 0.47 mls | 26,485<br>or 5.02 mls |

No. 1.—Continued. STATE CONTRACTS.

| Cubic Yards | Price—Cents | Cost | STREAM | REMARKS |
|---|---|---|---|---|
| DISTRICT. | | | | |
| 16,359 | 20. | $ 5,862 80 | Mississippi Riv | |
| 12,955 | | | | |
| .......... | 14.95 | ............ | Mississippi Riv | |
| 157,719 | | 36,035 62 | Mississippi Riv | |
| 55,775 | | | Mississippi Riv | |
| 16,731 | | | Mississippi Riv | |
| 10,816 | | | Mississippi Riv | |
| 105,201 | 18.95 | 19,935 58 | Mississippi Riv | |
| 375,556 | ...... | $ 61.834 00 | | |
| 49,596 | ...... | 9,570 23 | | |
| 325,960 | ...... | $ 52,263 77 | | |
| .......... | ...... | ............ | ................ | Average price 16.03 cents per cubic yard |
| DISTRICT. | | | | |
| 269,139 | 18.5 | $ 49,790 71 | Mississippi Riv | |
| DISTRICT. | | | | |
| 55,502 | 32. | $ 30,940 16 | Mississippi Riv | |
| 12,509 | | | | |
| 28,677 | | | | |
| 14,054 | 19.50 | 2,740 53 | Mississippi Riv | |
| 32,652 | 17.90 | 5,844 70 | Mississippi Riv | |
| 143,394 | ...... | $ 39,525 39 | | |
| .......... | ...... | ............ | ................ | Average price 27.56 cents per cubic yard |

## APPENDIX A. STATEMENT

| Number | NAME OF CONTRACT. | PARISH | DATE OF | | LINEAR FEET | |
|---|---|---|---|---|---|---|
| | | | Contract | Final Certificate | New Levee | Enlargement |
| | | | LAKE BORGNE BASIN LEVEE | | | |
| 17 | Upper St. Bernard | St. Bernard | Aug.26,1902 | Oct. 21, 1903 | .......... | 6,854 |
| 18 | Pearl | Plaquemines | Oct. 31,1902 | Jan. 14, 1904 | .......... | 7,745 |
| 19 | Louisiana Store | Plaquemines | Dec. 15, 1903 | Mar.18,1904 | 1,407 | .......... |
| | Work done from April | 21, 1902, to A | pril 20, '04 | | 1,407<br>or0.27 mls | 14,599<br>or2.76 mls |
| | | | GRAND PRAIRIE LEVEE | | | |
| 20 | Grand Prairie | Plaquemines | Sept.10,1903 | Feb. 24,1904 | 2,309 | 9,303 |
| 21 | Devils Flats | Plaquemines | Aug.26,1902 | Dec. 19,1902 | 7,050 | 7,270 |
| 22 | Bayou Goubray to New Canal | Plaquemines | Dec. 28, 1903 | Mar.14,1904 | 14,165 | .......... |
| | Work done from April | 21, 1902, to A | pril 20, '04 | | 23,524<br>or4.46 mls | 16,573<br>or3.14 mls |
| | | | BURAS LEVEE | | | |
| 23 | Buras— | Plaquemines | Oct. 12, 1903 | Mar. 1, 1904 | .......... | .......... |
| | Giordana Sect. | | | | .......... | 605 |
| | Organe Farm Sect. | | | | .......... | 1,510 |
| | Vacaro Sect. | | | | .......... | 900 |
| | Pignola Sect. | | | | 922 | .......... |
| | Vacherie Sect. | | | | 1,305 | .......... |
| | Oteri-Smith Sect. | | | | 2,105 | .......... |
| 24 | Boothville— | Plaquemines | Aug.26,1902 | Dec.24, 1903 | .......... | .......... |
| | Boothville Sect. | | | | .......... | 2,115 |
| | Leovy Sect. | | | | 1,500 | .......... |
| | Booth Sect. | | | | 900 | .......... |
| | Work done from April | 21, 1902, to A | pril 20, '04 | | 6,732<br>or1.28 mls | 5,130<br>or0.97 mls |

No. 1.—Continued.

## STATE CONTRACTS.

| Cubic Yards | Price—Cents | Cost | STREAM | REMARKS |
|---|---|---|---|---|
| DISTRICT. | | | | |
| 24,311 | 19.6 | 4,764.95 | Mississippi Riv | |
| 29,960 | 15.25 | 4,568.90 | Mississippi Riv | |
| 16,632 | 17½ | 2,910.60 | Mississippi Riv | |
| 70,903 | ...... | 12,244.45 | | |
| .......... | ...... | ............ | .................. | Average price 17.27 cents per cubic yard. |
| DISTRICT. | | | | |
| 42,525 | 14.9 | 6,336.22 | Mississippi Riv | |
| 30,530 | 11⅔ | 3,561.83 | Mississippi Riv | |
| 36,901 | 13.88 | 5,121.85 | Mississippi Riv | |
| 109,956 | ...... | 15,019.90 | | |
| .......... | ...... | ............ | .................. | Average price 13.66 cents per cubic yard. |
| DISTRICT. | | | | |
| .......... | ...... | ............ | | |
| 1,668 | 17⅔ | 294.65 | Mississippi Riv | |
| 3,741 | ...... | 660.94 | Mississippi Riv | |
| 3,920 | ...... | 692.53 | Mississippi Riv | |
| 5,817 | ...... | 1,027.67 | Mississippi Riv | |
| 9,162 | ...... | 1,618.62 | Mississippi Riv | |
| 15,184 | ...... | 2,682.51 | Mississippi Riv | |
| .......... | ...... | ............ | Mississippi Riv | |
| 4‘856 | 17.24 | 837.17 | Mississippi Riv | |
| 8,502 | ...... | 1,465.74 | Mississippi Riv | |
| 5,433 | ...... | 936.65 | Mississippi Riv | |
| 58,283 | ...... | 10,216.51 | | |
| .......... | ...... | ............ | .................. | Average price 17.53 cents per cubic yard. |

APPENDIX A. STATEMENT

| Number | NAME OF CONTRACT. | PARISH | DATE OF | | LINEAR FEET | |
|---|---|---|---|---|---|---|
| | | | Contract | Final Certificate | New Levee | Enlargement |
| | | | CADDO LEVEE | | | |
| 25 | Thompson— | Caddo ........ | Act 70, | Sept. 21, '03 | 2,980 | .......... |
| | Elmer Sect. ........ | Caddo ........ | 1900 | Sept. 21, '03 | 3,612 | .......... |
| 26 | Magnolia ............ | Caddo ....... | Nov. 1, 1902 | June 11, '03 | 2,820 | .......... |
| 27 | Campo Bello.......... | Caddo ....... | Oct. 29, 1902 | Aug. 24, '03 | 4,925 | 130 |
| | Work done from April | 21, 1902, to A | pril 20, '04.. | ............ | 14,387<br>or 2.72 mls | 130<br>or 0.02 mls |
| | | | BOSSIER LEVEE | | | |
| 28 | Willow Bend.......... | Bossier ...... | Jan. 15, '02 | June 16, '02 | .......... | 8,000 |
| 29 | Rough and Ready..... | Bossier ...... | Sept. 10, '03 | ............ | 3,104 | .......... |
| 30 | Gold Dust-Hopewell— | Bossier ...... | Oct. 29, '02 | Sept. 2, '03 | .......... | .......... |
| | Gold Dust Sect. ..... | ................. | ............ | ............ | 4,356 | .......... |
| | Hopewell Sect. ..... | ................. | ............ | ............ | 4,665 | .......... |
| | Elm Grove Sect. .... | ................. | ............ | ............ | 3,242 | .......... |
| | Van Hoose Sect. .... | ................. | ............ | ............ | 3,386 | .......... |
| | | Totals ....... | ............ | ............ | 18,753 | 8,000 |
| | Less work done previous | to April 20, '02 | ............ | ............ | .......... | 2,700 |
| | Work done from April | 21, 1902, to A | pril 20, '04 | ............ | 18,753<br>or 3.55 mls | 5,300<br>or 1.00 mls |
| | | | RED RIVER, ATCHAFALAYA AND | | | |
| 31 | Bayou Rapides........ | Rapides ...... | Nov. 24, '03 | Jan. 15, '04 | .......... | 718 |
| 32 | Watts Lane to Sandusky | Rapides ...... | Oct 26, '03 | ............ | .......... | 19,840 |
| 33 | Upper Choctaw Bayou. | Rapides ...... | Oct. 12, '03 | ............ | .......... | 3,840 |
| 34 | Jack Wilson— | Rapides ...... | Aug. 5. '03 | ............ | .......... | 1,840 |
| | Hathorne Sect. ..... | ................. | ............ | ............ | .......... | 1,340 |
| 35 | Sunny Home.......... | Rapides ...... | Aug. 4, '03 | Jan. 26, '04 | .......... | 9,450 |
| 36 | Bordeloneville ........ | Avoyelles .... | Jan. 14, '03 | Sept. 17, '03 | .......... | 9,950 |
| 37 | Glen Mary to Yellow Bayou ........... | Avoyelles .... | Oct. 22, '01 | May 26, '02 | 448 | 20,700 |
| | | Totals ....... | ............ | ............ | 448 | 67,678 |
| | Less work done previous | to April 21, 19 | 02, and | | | |
| | Not completed April 20, | 04 ........... | | ............ | .......... | 19,180 |
| | Work done from April | 21, 1902, to A | pril 20, '0 | 4.......... | 448<br>or 0.08 mls | 48,498<br>or 9.18 mls |
| | Amouts deducted as abo | ve— | | | | |
| | Work done previous to | April 21, 1902. | ............ | ............ | .......... | 16,000 |
| | Work not completed Ap | ril 20, 1904... | ............ | ............ | .......... | 3,180 |
| | Total to be deducted. | .... ............ | ............ | ............ | .......... | 19,180 |

No. 1.—Continued. STATE CONTRACTS.

| Cubic Yards | Price—Cents | Cost | STREAM | REMARKS |
|---|---|---|---|---|
| DISTRICT. | | | | |
| 59,743 | 22.75 | 13,591.53 | Red River..... | Caddo Board paid $1500.00 additional. |
| 53,814 | 22.75 | 12,242.68 | Red River..... | |
| 30,865 | 12 | 3,703.80 | Red River..... | |
| 68,603 | 16.7 | 11,456.70 | Red River..... | |
| 213,025 | ...... | 40,994.71 | ................. | Average price 19.20 cents per cu. yd. |
| DISTRICT. | | | | |
| 61,167 | 14 4 | 8,808.04 | Red River..... | |
| 83,843 | 17.4 | 14,588.68 | Red River..... | |
| | 15.45 | | Red River..... | |
| 75,475 | | 41,153.23 | Red River..... | |
| 83,180 | | | Red River..... | |
| 58,442 | | | Red River..... | |
| 49,267 | | | Red River..... | |
| 411,374 | ...... | 64,549.95 | | |
| 19,000 | ...... | 2,736.00 | | |
| 392,374 | ...... | 61,813.95 | ................. | Average price 15.75 cents per cu. yd. |
| BAYOU BOEUF LEVEE DISTRICT. | | | | |
| 3,321 | 48. | 1,594.08 | Bayou Rapides. | |
| 89,987 | 22.23 | 20,004.11 | Red River..... | |
| 28,676 | 18.4 | 5,276.38 | Red River..... | |
| 4,200 | 19.98 | 839.16 | Red River..... | |
| 6,900 | 19.98 | 1,378.62 | Red River..... | |
| 43,706 | 17.5 | 7,648.55 | Red River..... | |
| 39,940 | 14.9 | 5,951.06 | B'u des Gaizes | |
| 84,258 | 16.5 | 13,902.57 | B'u des Gaizes | |
| 300,988 | ...... | 56,594.53 | | |
| 74,100 | ...... | 12,612.78 | | |
| 226,888 | ...... | 43,981.75 | ................. | Average price 19.39 cents per cu. yd. |
| 63,000 | ...... | 10,395.00 | | |
| 11,100 | ...... | 2,217.78 | | |
| 74,100 | ...... | 12,612.78 | | |

APPENDIX A. STATEMENT

RECAPITULATION.

| DISTRICT | MILES | |
|---|---|---|
| | New Levee | Enlargement |
| Fifth Louisiana Levee District | 10.42 | 9.53 |
| Atchafalaya Basin Levee District | 0.72 | 4.97 |
| Pontchartrain Levee District | 1.16 | ........... |
| Lafourche Basin Levee District | 0.47 | 5.02 |
| Lake Borgne Basin Levee District | 0.27 | 2.76 |
| Grand Prairie Levee District | 4.46 | 3.14 |
| Buras Levee District | 1.28 | 0.97 |
| Caddo Levee District | 2.72 | 0.02 |
| Bossier Levee District | 3.55 | 1.00 |
| Red River, Atchafalaya and Bayou Bœuf Levee District | 0.08 | 9.18 |
| Totals | 25.13 | 36.59 |

No. 1.—Continued. STATE CONTRACTS.

| Cubic Yards | Average Price | Cost | REMARKS |
|---|---|---|---|
| 827,447 | 14.95 | $123,769 01 | |
| 325,960 | 16.03 | 52,263 77 | |
| 269,139 | 18.50 | 49,790 71 | |
| 143,394 | 27.56 | 39,525 39 | |
| 70,903 | 17.27 | 12,244 45 | |
| 109,956 | 13.66 | 15,019 90 | |
| 58,283 | 17.53 | 10,216 51 | |
| 213,025 | 19.20 | 40,994 71 | |
| 392,374 | 15.75 | 61.813 95 | |
| 226,888 | 19.39 | 43,981 75 | |
| 2,637,369 | 17.05 | 449,620 15 | |

## APPENDIX A. STATEMENT

Levee work undertaking by the Board of Commissioners of the Tensas
1902 to April

| Number | NAME OF CONTRACT. | PARISH | DATE OF Contract | DATE OF Final Certificate | LINEAR FEET New Levee | LINEAR FEET Enlargement |
|---|---|---|---|---|---|---|
| 1 | Repair Lucca Loop and Oppossum Fork Loop. | Desha Co., Ark. | ............ | Oct. 13, '03 | .......... | .......... |
| 2 | Fulton Lake.......... | Desha Co., Ark. | Sept. 3, '02 | Mar. 12, 04 | .......... | 22,042 |
| 3 | Repair Gaines to Panther Forest......... | Chicot Co., Ark. | ............ | Dec. 22, '03 | .......... | .......... |
| 4 | Repair Panther Forest. | Chicot Co., Ark. | ............ | Nov. 20, '03 | .......... | .......... |
| 5 | Spur Levee Leland Neck | Chicot Co., Ark. | Oct. 14, '03 | Feb. 1, 04 | .......... | .......... |
| 6 | Repair Vancluse.......... | Chicot Co., Ark. | ............ | Nov. 25, '03 | .......... | .......... |
|  | Work done from April | 21, 1902, to A | pril 20, '04 | ............ | .......... | 22,042<br>or 4.17 mls |

No. 2. TENSAS BASIN LEVEE DISTRICT.

**Basin Levee District, under six contracts entered into from April 21, 20, 1904.**

| Cubic Yards | Price—Cents | Cost | STREAM | REMARKS |
|---|---|---|---|---|
| .......... | ...... | 1,896.00 | Mississippi Riv | |
| 179,957 | 34½ | 62,085.16 | Mississippi Riv | |
| .......... | ...... | 2,736.00 | Mississippi Riv | |
| .......... | ...... | 2,982.00 | Mississippi Riv | |
| 129,199 | 19.35 | 25,000.00 | Mississippi Riv | |
| .......... | ...... | 2,016.00 | Mississippi Riv | |
| 309,156 | ...... | 96,715.16 | | |
| .......... | ...... | ........... | ........ ......... | Average price 28.16 cents per cu. yd. |

## APPENDIX A. STATEMENT

Levee work undertaken by the Board of Commissioners of the Fifth
April 21, 1902 to April 20, 1904 with four con-

| Number | NAME OF CONTRACT. | PARISH | DATE OF | | LINEAL FEET | |
|---|---|---|---|---|---|---|
| | | | Contract | Final Certificate | New Levee | Enlargement |
| 1 | Bunches Bend | E. Carroll | Aug. 12, '02 | | | 49,955 |
| 2 | Opossum Pt. (topping) | E. Carroll | Aug. 5, '03 | Mar. 8, '04 | | 8,355 |
| 3 | Donna Vista Enlargement | E. Carroll | May 26, '03 | Feb. 5, '04 | | 3,185 |
| 4 | Donna Vista Enlargement | E. Carroll | Feb. 27, '04 | | | 3,110 |
| 5 | Elton Banquette | E. Carroll | | | | 6,300 |
| 6 | HollyBrook | E. Carroll | Aug. 10, '03 | Feb. 13, '04 | 5,518 | |
| 7 | Otter Bayou to Pt. Lookout | E. Carroll | Aug. 12, '02 | Apr. 11, '04 | | 13,380 |
| 8 | Ramp at Alsatia | E. Carroll | | Dec. 19, '02 | | |
| 9 | Willow Pt. Capping | E. Carroll | Feb. 29, '04 | | | 21,300 |
| 10 | Pecan Grove to Henderson | E. Carroll | Sept. 30, '01 | Sept. 8, '02 | | 9,343 |
| 11 | Mascot | Madison | Sept. 10, '03 | | 3,238 | |
| 12 | Villa Vista, Miliken Bend Cabine Teele— | Madison | Feb. 21, '04 | Apr. 11, '04 | | |
| | Miliken Bend Sect. | | | | | 1,475 |
| | Cabin Teele Sect. | | | | | 4,044 |
| 13 | Road Crossing back of Killarney | Madison | | Dec. 19, '02 | | |
| 14 | Ramp at Killarney | Madison | | Dec. 19, '02 | | |
| 15 | Martin Loop to Bedford | Madison | July 10, '02 | Oct. 24, '02 | | 18,800 |
| 16 | Martin Loop | Madison | | Apr. 13, '04 | 4,300 | |
| 17 | Martin Loop | Madison | Dec. 9, '03 | Apr. 13, '04 | 3.260 | |
| 18 | Hardtimes | Tensas | Aug. 12, '02 | Mar. 2, '03 | | 1,616 |
| 19 | St. Joseph Front | Tensas | Dec. 2, '03 | | | 3,975 |
| 20 | Harper | Tensas | Aug. 12, '02 | Oct. 26, '03 | | 13,640 |
| 21 | Harper to Stockridge | Tensas | Sept. 16, '01 | Dec. 20, '02 | | 16,577 |
| 22 | Cane Brake Banquette. | Concordia | Jan. 12, '03 | July 14, '03 | | 8,865 |
| 23 | Gordon Enlargement | Concordia | | Jan. 15, '03 | | 560 |
| 24 | Sycamore Topping | Concordia | Sept. 22, '02 | May 12, '03 | | 14,925 |
| 25 | Sycamore | Concordia | Sept. 10, '03 | Apr. 8 '04 | 6,432 | 3,460 |
| 26 | Carter to Vidalia | Concordia | Sept. 10, '01 | June 20, '02 | | 28,210 |
| 27 | Vidalia 1902 | Concordia | May 14, '02 | June 9, '02 | 820 | 1,300 |
| 28 | Green | Concordia | Sept. 10, '03 | Oct. 13, '03 | 732 | |
| 29 | Upper Green— | Concordia | Sept. 10, '01 | May 26, '92 | | 9,393 |
| | Fairview Sect. | Concordia | | | 4,230 | |
| 30 | Upper Bougere, Sect. 1 and 2. | Concordia | May 14, '02 | Nov. 18, '02 | 10,300 | |
| 31 | Upper Bougere, Sect. 3. | Concordia | May 14, '02 | Mar. 2, '03 | 3,000 | |
| | | Totals | | | 41,830 | 241,768 |
| | Less work done previous | to April 21, 19 | 02, and | | | |
| | not completed April 25, | 1904 | | | 2,030 | 89,182 |
| | Work done from April | 21, 1902, to April | 20, 1904 | | 39,800<br>or 7.54 mls | 152,586<br>or28.89ms |
| | Amount deducted as ab | ove— | | | | |
| | Work done previous to | April 21, 1902. | | | 2,030 | 48,292 |
| | Work not completed Ap | ril 20, 1904. | | | | 40,890 |
| | Total to be deducted. | | | | 2,030 | 89,182 |

## No. 3. FIFTH LOUISIANA LEVEE DISTRICT.

Louisiana Levee District under thirty-one contracts entered into from tracts of earlier date not completed April 21, 1902.

| Cubic Yards | Price | Cost | STREAM | REMARKS |
|---|---|---|---|---|
| 609,500 | 16 | $97,520.00 | Mississippi Riv | |
| 13,884 | 30 | 4,165.20 | Mississippi Riv | |
| 18,714 | 12.5 | 2,339.25 | Mississippi Riv | |
| 21,200 | 14½ | 3,074.00 | Mississippi Riv | |
| 25,000 | 13.90 | 3,475.00 | Mississippi Riv | |
| 375,232 | 27.5 | 103,188.80 | Mississippi Riv | |
| 182,228 | 26 | 47,379.28 | Mississippi Riv | |
| 3,610 | ...... | 794.20 | Mississippi Riv | |
| 35,000 | 25 | 8,750.00 | Mississippi Riv | |
| 58,273 | 12.97 | 7,558.01 | Mississippi Riv | |
| 100,000 | 19.9 | 19,900.00 | Mississippi Riv | |
| .......... | 25 | .......... | Mississippi Riv | |
| 3,531 | ...... | 882.75 | Mississippi Riv | |
| 9,651 | ...... | 2,412.75 | Mississippi Riv | |
| 337 | ...... | 50.19 | Mississippi Riv | |
| 1,704 | ...... | 228.08 | Mississippi Riv | |
| 29,841 | 35 | 10,444.35 | Mississippi Riv | |
| 160,082 | 32.74 | 52,410.84 | Mississippi Riv | |
| 142,428 | 31.24 | 44,494.50 | Mississippi Riv | |
| 22,192 | 22 | 4,882.24 | Mississippi Riv | |
| 49,403 | 39 | 19,267.17 | Mississippi Riv | |
| 142,248 | 24.73 | 35,177.93 | Mississippi Riv | |
| 107,121 | 30 | 32,136.30 | Mississippi Riv | |
| 28,841 | 10 | 2,884.10 | Mississippi Riv | |
| 3,629 | 25 | 907.25 | Mississippi Riv | |
| 16,301 | 20 | 3,260.20 | Mississippi Riv | Revetment $325 additional. |
| 140,788 | 16.75 | 23,581.99 | Mississippi Riv | |
| 103,518 | 12 | 12,422.16 | Mississippi Riv | |
| 22,924 | 15<br>16<br>20 | 3,985.40 | Mississippi Riv | |
| 9,084 | 24 | 2,180.16 | Mississippi Riv | |
| 52,322 | 15.4 | 8,057.59 | Mississippi Riv | |
| 63‘163 | ...... | 9,727.10 | Mississippi Riv | |
| 192,836 | 16.7 | 32,203.61 | Mississippi Riv | |
| 125,433 | 31.46 | 39,461.22 | Mississippi Riv | |
| 2,870,018 | ...... | 639,201.62 | | |
| 556,106 | ...... | 98,256.37 | | |
| 2,313,912 | ...... | 540,945.25 | | |
| .......... | ...... | .......... | .................. | Average price 23.38 cents per cu. yd. |
| 271,906 | ...... | 51,797.37 | | |
| 284,200 | ...... | 46,459.00 | | |
| 556,106 | ...... | 98,256.37 | | |

## APPENDIX A. STATEMENT

**Levee work undertaking by the Board of Commissioners of the Atchafa-**
**April 21, 1902, to April 20, 1904, with four contracts**

| Number | NAME OF CONTRACT. | PARISH | DATE OF |  | LINEAR FEET |  |
|---|---|---|---|---|---|---|
|  |  |  | Contract | Final Certificate | New Levee | Enlargement |
| 1 | Dameron and White '02 |  | Jan. 1, '02 | Feb. 10, '03 |  |  |
|  | Raccourci to Longw'd |  |  |  |  | 900 |
|  | New Texas to Grand. |  |  |  |  | 6,550 |
|  | St. Claude |  |  |  |  | 3,840 |
|  | Solitude |  |  |  | 7,915 |  |
|  | Lobdell Enlargement |  |  |  |  | 4,630 |
|  | St. Michael |  |  |  |  | 3,165 |
|  | Marioneaux |  |  |  |  | 3,210 |
|  | Bayou Goula |  |  |  |  | 4,029 |
| 2 | Dameron and White '03 |  | Jan. 12, '03 |  |  |  |
|  | Poplar Grove |  |  |  |  | 15,090 |
|  | Missouri Enlargem't. |  |  |  |  | 4,000 |
|  | Missouri Wavewash |  |  |  |  | 3,232 |
|  | Hickey Capping |  |  |  |  | 1,570 |
|  | Eliza |  |  |  | 1,300 |  |
|  | Sardine Point |  |  |  |  | 400 |
|  | Lefebvre |  |  |  | 1,700 |  |
|  | Australia |  |  |  |  | 8,500 |
|  | Plaquemines |  |  |  |  | 12,795 |
|  | Palo Alto |  |  |  | 3,255 |  |
|  | Texas |  |  |  | 800 |  |
| 3 | Morris Bayou | Pt. Coupee | Sept. 2, '02 | Dec. 30, '02 |  | 1,680 |
| 4 | Atchafalaya River | Pt. Coupee | Jan. 1, '02 |  | 50,466 |  |
| 5 | Oakley | Assumption |  | June 24, '02 | 684 |  |
| 6 | Belmont Church | Assumption |  | June 24, '02 |  | 3,690 |
|  | Totals |  |  |  | 66,120 | 77,281 |
|  | Less work done previous<br>Completed April 20, 190 | to April 21, 19<br>4 | 02, and not |  | 16,848 | 6,992 |
|  | Work done from April | 21, 1902, to A | pril 20, '04 |  | 49,272<br>or 9.33 mls | 70,289<br>or 13.31 mls |
|  | The above is divided by | Streams as foll | ows— |  | miles | miles |
|  | Mississippi River |  |  |  | 2.52 | 12.30 |
|  | Atchafalaya River |  |  |  | 6.68 | 0.31 |
|  | Bayou Lafourche |  |  |  | 0.13 | 0.70 |
|  | Total |  |  |  | 9.33 | 13.31 |
|  | Amount deducted as abo | ve— |  |  |  |  |
|  | Work done previous to | April 21, 1902 |  |  | 11,182 | 6,992 |
|  | Work not completed Ap | ril, 1904 |  |  | 5,666 |  |
|  | Total to be deducted |  |  |  | 16,848 | 6,992 |

## No. 4. ATCHAFALAYA BASIN LEVEE DISTRICT.

laya Basin Levee District, under six contracts, entered into from of earlier date not completed April 21, 1902.

| Cubic Yards | Price—Cents | Cost | STREAM | REMARKS |
|---|---|---|---|---|
| ........ | Scale | .......... | Mississippi Riv | |
| 12,457 | | $ 2,607.44 | Mississippi Riv | |
| 45,819 | | 11,475.58 | Mississippi Riv | |
| 29,726 | | 7,288.26 | Mississippi Riv | |
| 454,627 | | 102,210.59 | Mississippi Riv | |
| 39,466 | | 8,771.78 | Mississippi Riv | |
| 33,660 | | 7,224.53 | Mississippi Riv | |
| 38,334 | | 7.998.47 | Mississippi Riv | |
| 19,730 | | 3,265.07 | Mississippi Riv | |
| ........ | Scale | | | |
| 97,293 | | 99,676.68 | Mississippi Riv | |
| 26,291 | | | Mississippi Riv | |
| 10,666 | | | Mississippi Riv | |
| 384 | | | Mississippi Riv | |
| 52,951 | | | Mississippi Riv | |
| 3,797 | | | Mississippi Riv | |
| 56,912 | | | Mississippi Riv | |
| 67,606 | | | Mississippi Riv | |
| 85,674 | | | Mississippi Riv | |
| 91,748 | | | Mississippi Riv | |
| 23,283 | | | Mississippi Riv | |
| 4,300 | 25.00 | 1,075.00 | Atchafalaya R. | |
| 692,000 | 19.00 | 13,148.00 | Bayou Lafourche | |
| 15,699 | 20.00 | 3,139.80 | Bayou Lafourche | |
| 16,086 | Scale | 2.235.85 | Bayou Lafourche | |
| 1,918,511 | | 388,449.05 | | |
| 373,814 | | 73,875.77 | | |
| 1,544,697 | | 314,573.28 | | |
| .......... | ...... | .......... | .................. | Average price 20.33 cents per cu. yd. |
| 1,057,873 | | 222,482.22 | | |
| 455,039 | | 86,715.41 | | |
| 31,785 | | 5,375-65 | | |
| 1,544,697 | | 314,573.28 | | |
| 242,253 | | 48,879.18 | | |
| 131,561 | | 24,996.59 | | |
| 373,814 | | 73,875.77 | | |

## APPENDIX A. STATEMENT

Levee work undertaken by the Board of Commissioners of the Pontchar-
21, 1902 to

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | Benkin .................... | Iberville......... | Feb. 8, '04 | ............ | .......... | 3,381 |
| 2 | Jolisant ................... | Iberville......... | July 11, '03 | Jan. 19, '04 | .......... | 2,813 |
| 3 | Eighty-one Mile Pt. (Wave Wash) ................. | Ascension ....... | Jan. 12, '04 | Feb. 22, '04 | .......... | 3,320 |
| 4 | Evergreen ................ | Iberville ........ | July 11, 03 | Nov. 28, '03 | .......... | 5,930 |
| 5 | Hermitage ..... .......... | Ascension ....... | May 28, '02 | Sept. 24, '02 | 4,418 | 5,065 |
| 6 | Hermitage (Wave Wash).. | Ascension ....... | Jan. 12, '04 | Feb. 22, '04 | .......... | 4,565 |
| 7 | White Hall, Repair....... | St. James ....... | Mar. 10, '04 | ............ | .......... | 8,660 |
| 8 | New Hope................ | St. John......... | June 4, '02 | Sept. 15, '02 | 2,442 | .......... |
| 9 | Hope to Terre Haute...... | St. John......... | July 11, '03 | Mar. 1, '04 | .......... | 16,321 |
| 10 | Anchor Gypsy............ | St. Charles...... | Sept. 25, '03 | Dec. 28, '03 | .......... | 4,050 |
| 11 | St. Rose to Almedia...... | St. Charles...... | Sept. 21, '03 | Jan. 22, '04 | .......... | 12,725 |
| 12 | Butler-Kenner ........... | Jefferson ........ | July 11, '03 | Nov. 13, '03 | 765 | .......... |
| 13 | Parish line to Hanson City | Jefferson ........ | July 11, '03 | Nov. 13, '03 | .......... | 3,120 |
| 14 | Kennerville ............... | Jefferson ........ | July 11, '03 | Jan. 14, '04 | .......... | 7,900 |
| 15 | Trudeau .................. | Jefferson ........ | July 11, '03 | Feb. 27, '04 | .......... | 6,500 |
| 16 | Weckerling Farm ......... | Jefferson ........ | Sept. 2, '03 | Mar. 19, '04 | 1,982 | 3,585 |
| 17 | Bois Blanc Enlargement.. | Jefferson ........ | Sept. 21, '03 | Feb. 27, '04 | .......... | 1,749 |
| 18 | Perkins ................... | Jefferson ........ | Dec. 8, '03 | ............ | 2,514 | 20,900 |
| | Totals............. | .................. | ............ | ............ | 12,121 | 110,584 |
| | Less work not completed A | pril 20, 1904....... | ............ | ............ | .......... | 9,681 |
| | Work done from April 21, | 1902 to April 20, | 19041....... | ............ | 12,121<br>or 2.30 mls | 100,903<br>or 19.11 mls |

## No. 5. PONTCHARTRAIN LEVEE DISTRICT.

train Levee District, under eighteen contracts, entered into from April April 20, 1904.

| | | | | |
|---|---|---|---|---|
| 34,000 | 14.75 | $ 5,015.00 | Mississippi Riv. | |
| 28,756 | 18.44 | 5,302.60 | Mississippi Riv. | |
| .......... | ...... | 859.21 | Mississippi Riv. | Price $25.88 per 100 ft. |
| 54,311 | 18.44 | 10,014.94 | Mississippi Riv. | |
| 103,652 | 14.00 | 14,511.28 | Mississippi Riv. | |
| .......... | ...... | 1,181.42 | Mississippi Riv. | Price $25.88 per 100 ft. |
| 11,490 | 12.5 | 1,426.25 | Mississippi Riv. | |
| 87,470 | 20.4 | 17,843.88 | Mississippi Riv. | |
| 86,019 | 17.7 | 15,225.36 | Mississippi Riv. | |
| 35,302 | 36.00 | 12,708.72 | Mississippi Riv. | |
| 74,395 | 15.65 | 11,642.81 | Mississippi Riv. | |
| 29,062 | 19.94 | 5,794.96 | Mississippi Riv. | |
| 20,870 | 19.94 | 4,161.48 | Mississippi Riv. | |
| 41,146 | 19.94 | 8,204.51 | Mississippi Riv. | |
| 26,880 | 19.94 | 5,359.87 | Mississippi Riv. | |
| 71,741 | 19.9 | 14,276.45 | Mississippi Riv. | |
| 12,142 | 19.00 | 2,306.98 | Mississippi Riv. | |
| 147,300 | 17.95 | 26,440.35 | Mississippi Riv. | |
| 864,536 | ...... | 162,276.07 | | |
| 69,950 | ...... | 11,468.02 | | |
| 794,586 | ...... | 150,808.05 | | |
| .......... | ...... | ........... | .................. | Average Price 18.98 cents per cu. yd. |

APPENDIX A. STATEMENT

Levee work undertaken by the Board of Commissioners of the La-
April 21, 1902, to April 20, 1904, with one con-

| Number | NAME OF CONTRACT. | PARISH | DATE OF | | LINEAR FEET | |
|---|---|---|---|---|---|---|
| | | | Contract | Final Certificate | New Levee | Enlargement |
| 1 | Donaldsonville to Company Canal 1902 | | Mch. 5, 1902 | Mch. 3, 1903 | | |
| | Sect'ns— | | | | | |
| | Dugas to Cofield | | | | | 5,960 |
| | Rateau Store | | | | 1,252 | |
| | Cofield | | | | 722 | 3,949 |
| | Point Pleasant | | | | 5,360 | |
| | Pt. Plsnt. to Welcome | | | | 718 | 21,037 |
| | Avondale | | | | 1,382 | |
| | Avondale | | | | 940 | |
| | Tete Enlargement | | | | | 3,969 |
| | Platenville down | | | | | 8,280 |
| 2 | Donaldsonville to Company Canal 1903 | | Mch. 3, 1903 | Apr. 6, 1904 | | |
| | Sect'ns— | | | | | |
| | Dugas to Cofield | | | | | 3,754 |
| | Acadia | | | | 1,593 | |
| | Welcome | | | | 3,970 | |
| | Welcome Enlargem't | | | | | 616 |
| | Hymelia | | | | 1,856 | |
| | Flagville | | | | 2,018 | |
| 3 | Avondale Enlargement. | Jefferson | | Sept.11,1902 | | 785 |
| 4 | Live Oak | Plaquemines | Aug. 4, 1903 | Jan. 26, 1904 | | 4,250 |
| 5 | Star | Plaquemines | July 10, 1902 | Jan. 3, 1903 | 2,190 | |
| 6 | Myrtle Grove Enlargement | Plaquemines | Aug. 4, 1903 | Apr. 13, 1904 | | 4,495 |
| 7 | Myrtle Grove | Plaquemines | Aug. 4, 1903 | Oct. 1, 1903 | 1,073 | |
| | | Totals | | | 23,074 | 61,325 |
| | Less work done previous | to April 21, 19 | 02. | | 722 | 3,573 |
| | Work done from April | 21, 1902 to A | puil 20, '04 | | 22,352 | 57,752 |
| | The above is divided by | Streams as foll | ows— | | or 4.23 mls | or 10.94 mls |
| | Mississipi River | | | | 4.23 mls | 9.30 mls |
| | Bayou Lafourche | | | | | 1.64 |
| | | | | | 4.23 | 10.94 |

## No. 6. LAFOURCHE BASIN LEVEE DISTRICT.

fourche Basin Levee District, under six contracts, entered into from tract of earlierdate, not completed April 21, 1902.

| Cubic Yards | Price—Cents | Cost | STREAM | REMARKS |
|---|---|---|---|---|
| .......... | Scale | | | |
| 54,959 | | 11,067 18 | Mississippi Riv | |
| 34,042 | | 7,525 76 | Mississippi Riv | |
| 50,089 | | 9,270 36 | Mississippi Riv | |
| 147,101 | | 31,750 84 | Mississippi Riv | |
| 181,296 | | 34,842 73 | Mississippi Riv | |
| 34,697 | | 7,288 39 | Mississippi Riv | |
| 23,573 | | 4,985 69 | Mississippi Riv | |
| 21,647 | | 4,956 07 | Bayou Lafourche | |
| 62,368 | | 15,384 56 | Bayou Lafourche | |
| .......... | Scale | | | |
| 17,497 | | 3,535 26 | Mississippi Riv | |
| 42,396 | | 9,042 56 | Mississippi Riv | |
| 123,464 | | 28,342 14 | Mississippi Riv | |
| 3,079 | | 519 80 | Mississippi Riv | |
| 32,338 | | 5,811 29 | Mississippi Riv | |
| 41,516 | | 7,966 05 | Mississippi Riv | |
| 5,479 | 26. | 1,423 54 | Mississippi Riv | |
| 25,607 | Scale | 3,957 08 | Mississippi Riv | |
| 19,953 | Scale | 2,871 46 | Mississippi Riv | |
| | | | Mississippi Riv | |
| 16,934 | Scale | 2,559 08 | Mississippi Riv | |
| 11,990 | Scale | 1,845 11 | Mississippi Riv | |
| 976,650 | | 199,983 46 | | |
| 19,480 | | 4,459 45 | | |
| 957,170 | | 195,524 01 | | Average price 20.43 cents per cu. yd. |
| 892,635 | | 179,642 83 | | |
| 64,535 | | 15,881 18 | | |
| 957,170 | | 195,524 01 | | |

## APPENDIX A. STATEMENT

Levee work undertaken by the Board of Commissioners of the Grand
April 21, 1902, to

| Number | NAME OF CONTRACT. | PARISH | DATE OF |  | LINEAR FEET |  |
|---|---|---|---|---|---|---|
|  |  |  | Contract | Final Certificate | New Levee | Enlargement |
| 1 | Moran ............... | Plaquemines .. | Jan. 4, 1904 | Apr. 13, 1904 | 3,500 | 745 |
| 2 | Bayou Goubray........ | Plaquemines .. | Aug. 11, 1902 | Dec. 1, 1902 | 5,250 | .......... |
| 3 | New Canal........... | Plaquemines .. | Aug. 11, 1902 | Jan. 12, 1903 | 5,315 | .......... |
|  | Work done from April | 21, 1902, to A | pril 20, 1904. | ............ | 14,065<br>or 2.66 mls | 745<br>or 0.14 mls |

## No. 7. GRAND PRAIRIE LEVEE DISTRICT.

Prairie Levee District, under three contracts, entered into from April 20, 1904.

| Cubic Yards | Price—Cents | Cost | STREAM | REMARKS |
|---|---|---|---|---|
| 9,326 | 13. | $ 1,212 38 | Mississippi Riv | |
| 12,231 | 11. | 1,345 41 | Mississippi Riv | |
| 11,232 | 11. | 1,235 52 | Mississippi Riv | |
| 32,789 | ...... | $ 3,793 31 | | |
| ......... | ...... | ............ | .................. | Average price 11.57 cents per cu. yd. |

APPENDIX A. STATEMENT

Levee work undertaken by the Board of Commissioners of the
entered into from April 21,

| Number | NAME OF CONTRACT. | PARISH | DATE OF | | LINEAR FEET | |
|---|---|---|---|---|---|---|
| | | | Contract | Final Certificate | New Levee | Enlargement |
| 1 | Sect. 1, Gulf Coast.... | Plaquemines .. | Oct. 16, 1902 | ............ | 65,255 | .......... |
| 2 | Sect. 2, Gulf Coast.... | Plaquemines .. | Oct. 16, 1902 | ............ | 60,099 | .......... |
| 3 | Sect. 3, Gulf Coast.... | Plaquemines .. | Oct. 16, 1902 | ............ | 44,445 | .......... |
| | Totals.............. | ................ | ............ | ............ | 169,799 | .......... |
| | Less work not completed | April 20, 1904. | ............ | ............ | 134,139 | .......... |
| | Work done from April | 21, 1902, to A | pril 20, 1904. | ............ | 35,660<br>or 6.75 mls | .......... |

## No. 8. PLAQUEMINE PARISH E. BANK LEVEE DIST.

Plaquemines Parish East Bank Levee District, under three contracts, 1902, to April 20, 1904.

| Cubic Yards | Price—Cents | Cost | REMARKS |
|---|---|---|---|
| 500,000 | 9.25 | $ 46,250 00 | |
| 450,000 | 9.25 | 41,625 00 | |
| 400,000 | 9.25 | 37,000 00 | |
| 1,350,000 | ...... | $ 124,875 00 | |
| 1,176,845 | ...... | 108,858 16 | |
| 173,155 | ...... | $ 16,016 84 | |
| .......... | ...... | ............ | Average price 9.25 cents per cubic yard |

## APPENDIX A. STATEMENT

Levee work undertaken by the Board of Commissioners of the April 21, 1902, to

| Number | NAME OF CONTRACT. | PARISH | DATE OF | | LINEAR FEET | |
|---|---|---|---|---|---|---|
| | | | Contract | Final Certificate | New Levee | Enlargement |
| 1 | Cavitt | Caddo | May 7, 1903 | Mar. 28, '04 | 4,305 | .......... |
| 2 | Simpson Lake | Caddo | Dec. 3, 1903 | Feb. 18, 1904 | .......... | 2,150 |
| 3 | Wild Lucia | Caddo | May 6, 1903 | Oct. 6, 1903 | 4,783 | .......... |
| 4 | Hurricane Bluff | Caddo | Feb. 4, 1903 | May 7, 1903 | 7,728 | .......... |
| 5 | Eric to Buckhall | Caddo | May 14, 1902 | June 29, '03 | 19,199 | .......... |
| 6 | Babley | Caddo | Feb. 18, 1903 | Oct. 13, 1903 | .......... | 5,913 |
| 7 | Long Point, Sect. 1 | Caddo | Feb. 18, 1903 | Aug. 11, 1903 | 1,653 | .......... |
| | Long Point, Sect, 2 | Caddo | .......... | .......... | 3,126 | .......... |
| 8 | Woodlawn | Caddo | Feb. 18, 1903 | Aug. 11, 1903 | .......... | 3,149 |
| 9 | Ashwood | Caddo | Feb. 18, 1903 | Sep. 21, 1903 | .......... | 4,992 |
| 10 | Upper Pascagoula— | Caddo | Feb. 18, 1903 | Aug. 28, 1903 | .......... | 810 |
| | Logie Lea Sect. | .......... | .......... | .......... | 5,920 | .......... |
| 11 | White Hall | Caddo | Feb. 4, 1903 | June 8, '03 | 3,479 | .......... |
| 12 | Cross Keys | Caddo | May 6, 1903 | Sept. 2, 1903 | 5,472 | .......... |
| | Work done from April 21, 1902, to April 20, 1904 | | | .......... | 55,665<br>or 10.5 mls | 18,814<br>or 3.56 mls |

No. 9.

## CADDO LEVEE DISTRICT.

Caddo Levee District, under twelve contracts, entered into from April 20, 1904.

| Cubic Yards | Price—Cents | Cost | STREAM | REMARKS |
|---|---|---|---|---|
| 100,007 | 17.4 | $ 17,401 21 | Red River..... | |
| 10,281 | 50. | 5,140 50 | Red River..... | |
| 79,517 | 15.4 | 12,245 61 | Red River..... | |
| 48,434 | 13.4 | 6,490 15 | Red River..... | |
| 226,975 | 13.45 | 30,528 13 | Red River..... | |
| 39,151 | 16.25 | 6,362 04 | Red River..... | |
| 26,333 | 16.25 | 4,279 11 | Red River..... | |
| 32,761 | ..... | 5.323 66 | Red River..... | |
| 13,166 | 16.25 | 2,139 47 | Red River..... | |
| 19,100 | 16.25 | 3,103 75 | Red River..... | |
| 3,375 | 16.25 | 548 44 | Red River..... | |
| 102,339 | 16.25 | 16,630 08 | Red River..... | |
| 30,363 | 14.69 | 4,460 32 | Red River..... | |
| 94,393 | 17.5 | 16,518 77 | Red River..... | |
| 831,773 | ...... | $ 132,077 66 | | |
| .......... | ...... | ........... | .................. | Average price 15.8 cents per cubic yard. |

APPENDIX A. STATEMENT

Levee work undertaken by the Board of Commissioners of the Bossier
to April

| Number | NAME OF CONTRACT. | PARISH | DATE OF Contract | DATE OF Final Certificate | LINEAR FEET New Levee | LINEAR FEET Enlargement |
|---|---|---|---|---|---|---|
| 1 | Willow Chute | Bossier | Nov. 5, '02 | Apr. 27, '03 | 3,118 | |
| 2 | Buckhall | Bossier | Mar. 5, '02 | Apr. 27, '03 | 2,426 | |
| 3 | Scopini | Bossier | Aug. 6, '03 | Feb. 29, '04 | 4,003 | |
| 4 | Dortch | Bossier | Feb. 5, 03 | Oct. 6, '03 | 9,673 | |
| 5 | Christiana | Bossier | Nov. 16, '02 | Mar. 16, '03 | 3,400 | |
| 6 | Buckhorn | Bossier | Feb. 5, '03 | June 16, '03 | 3,386 | |
| | Lovely Point Sect. | | | | 3,178 | |
| 7 | Bear Point Spur | Bossier | Feb. 16, '04 | | 500 | |
| 8 | Muiock Bayou | Bossier | Feb. 14, '04 | | 1,063 | |
| 9 | Swift-Chute Bayou | Bossier | Feb 16, '04 | | 2,476 | |
| | Totals | | | | 33,223 | |
| | Less work not complete | d April 20, '04. | | | 619 | |
| | Work done from April | 21, 1902, to A | pril 20, '04 | | 32,604<br>or 6.17 mls | |

No. 10.

## BOSSIER LEVEE DISTRICT.

Levee District, under nine contracts, entered into from April 21, 1902, 20, 1904,

| Cubic Yards | Price—Cents | Cost | STREAM | REMARKS |
|---|---|---|---|---|
| 23,547 | 13.9 | $ 3,273.03 | Red River..... | |
| 18,227 | 15.69 | 2,859.81 | Red River..... | |
| 96,417 | 20.00 | 19,283.40 | Red River..... | |
| 236,815 | 17.8 | 42,153.07 | Red River..... | |
| 21,370 | 13.37 | 2,857.16 | Red River..... | |
| 22,451 | 15.9 | 3,569.70 | Red River..... | |
| 25,048 | ...... | 3,982.63 | Red River..... | |
| 6,400 | 17.00 | 1,088.00 | Red River..... | |
| 15,300 | 18.00 | 2,754.00 | Red River..... | |
| 43,800 | 18.00 | 7,884.00 | Red River..... | |
| 509,375 | ...... | 89,704.80 | | |
| 10,950 | ...... | 1,971.00 | | |
| 498,425 | ...... | 87,733.80 | | |
| .......... | ...... | ........... | .................. | Average price 17.6 cents per cubic yard. |

APPENDIX A. STATEMENT

Levee work undertaken by the Board of Commissioners of the Red tracts, entered into from April 21, 1902, to April 20, 1904, with

| Number | NAME OF CONTRACT. | PARISH | DATE OF Contract | DATE OF Final Certificate | LINEAR FEET New Levee | LINEAR FEET Enlargement |
|---|---|---|---|---|---|---|
| 1 | Mill Bayou to Glen Mary | Avoyelles | Feb. 19,1902 | June 16,1902 | | 19,600 |
| 2 | Harvey Bayou to Green Store | St. Landry | Aug. 6, 1903 | Dec. 14, 1903 | 842 | 4,455 |
| 3 | Davis Bayou | St. Landry | Dec. 12,1903 | Jan. 25, 1904 | 537 | |
| 4 | Elba | St. Landry | Aug. 6, 1903 | Oct. 30, 1903 | | 4,515 |
| 5 | Bayou Rouge Dyke | St. Landry | Aug. 6, 1903 | Jan. 25, 1904 | | 1,465 |
| 6 | Melville | St. Landry | Aug. 6, 1903 | Jan. 25, 1904 | | 7,400 |
| 7 | Melville to Bayou Petite Prairie | St. Landry | Mar. 27,1901 | Nov. 17,1902 | 13,670 | 2,030 |
| 8 | Bayou Petite Prairie, S. | St. Landry | July 16,1902 | | 10,700 | |
| | | Totals | | | 25,749 | 39,465 |
| | Less work done previous<br>Completed April 20, '04 | to April 21, 19 | 02, and not | | 20,921 | 16,945 |
| | Work done from April | 21, 1902, to A | pril 20, 1904 | | 4,828<br>or 0.91 mls | 22,520<br>or 4.26 mls |
| | The above is divided by | Streams as foll | ows— | | | |
| | Bayou des Glaizes | | | | | 0.63 mls |
| | Atchafalaya River | | | | 0.91 mls | 3.63 |
| | | | | | 0.91 | 4.26 |
| | Amount deducted as ab | ove— | | | | |
| | Work done previous to | April 21, 1902. | | | 13,321 | 16,945 |
| | Work not completed Ap | ril 20, 1904 | | | 7,600 | |
| | Total to be deducted. | | | | 20,921 | 16,945 |

## No. 11. RED RIVER, ATCHAFALAYA AND BAYOU BOEUF LEVEE DISTRICT.

River, Atchafalaya and Bayou Bœuf Levee District, under eight con-
two contracts of earlier date not completed April 21, 1902.

| Cubic Yards | Price—Cents | Cost | STREAM | REMARKS |
|---|---|---|---|---|
| 69,197 | 18.8 | $13,009 03 | B'u des Glaizes | |
| 40,932 | 22.0 | 9,005 04 | Atchafalaya R. | |
| 10,705 | 22. | 2,355 10 | Atchafalaya R. | |
| 19,818 | 15.9 | 3,151 06 | Atchafalaya R. | |
| 14,638 | 22. | 3,220 36 | Atchafalaya R. | |
| 32,862 | 22. | 7,229 64 | Atchafalaya R. | |
| 226,524 | 21.7 | 49,155 70 | Atchafalaya R. | |
| 193,285 | 19.95 | 38,560 35 | Atchafalaya R. | |
| 607,961 | | $125,686 28 | | |
| 370,285 | | 76,103 35 | | |
| 237,676 | | $49,582 93 | | |
| 15,197 | | $2,857 03 | | |
| 222,479 | | 46,725 90 | | |
| 237,676 | | $49,582 93 | | Average price 20.86 cents per cu. yd. |
| 217,000 | | $45,523 00 | | |
| 153,285 | | 30,580 35 | | |
| 370,285 | | $76,103 35 | | |

## APPENDIX A. STATEMENT

Drainage work undertaken by the Board of Commissioners of the Red
entered into from April 21, 1902 to April 20, 1904 with four

| Number | NAME OF CONTRACT. | PARISH | DATE OF Contract | DATE OF Final Certificate | MILES Excavation | MILES Clearing |
|---|---|---|---|---|---|---|
| 1 | Alex. to Chatlins Lake | Rapides ...... | Sept. 6, 01 | Feb. 3, '04 | 14.34 | 14.34 |
| 2 | Chatlins Lake to Three Prong Lake........ | Rapides and Avoyelles | Feb. 25, '04 | ........... | 9.60 | 14.00 |
| 3 | Three Prong Lake to Bayou des Glaizes... | Avoyelles ..... | Feb. 7, '01 | ........... | 17.30 | 14.50 |
| 4 | Mill Bayou to Bayou Rouget.................<br>Bayou Rouget to Turners Bayou................. | Avoyelles .... | Feb. 7, '01 | Feb. 3, '04 | 12.80 | 12.80 |
| 5 | Turners Bayou to Bayou Jack ............. | Avoyelles........ | Feb. 7, '01 | ........... | 2.50 | 2.50 |
| | | Totals ....... | ........... | ........... | 56.54 | 58.14 |
| | Less work done-previous to April 21, 1902, and not completed April 20, 1904 | .............. | ........... | ........... | 26.53 | 35.60 |
| | Work done from April 21, 1902, to April 20, 1904 | | | ........... | 30.01 | 22.54 |
| | Amounts deducted as above:— | | | | | |
| | Work done previous to April 21, 1902 .... | | ........... | ........... | 14.43 | 20.00 |
| | Work not completed April 20, 1904 ....... | | ........... | ........... | 12.10 | 15.60 |
| | Total to be deducted. | .................. | ........... | ........... | 26.53 | 35.60 |

## APPENDIX A. STATEMENT

Work for improvement of Bayou Lafourche undertaken by the Boards of
under three contracts entered into

| Number | NAME OF CONTRACT. | PARISH | DATE OF Contract | DATE OF Final Certificate | MILES New Levee | MILES Excavation |
|---|---|---|---|---|---|---|
| 1 | Bayou Lafourche Dam.. | Ascension .... | Nov. 12, '03 | Feb. 23, '04 | 0.08 | .......... |
| 2 | Bayou Lafourche. dredging ............... | .................. | Oct. 10, '03 | ........... | .......... | 12.12 |
| 3 | Lake Bœuf Canal...... | .................. | Oct. 10, '03 | ........... | .......... | 2.38 |
| | | | | | 0.08 | 14.50 |

## No. 12. RED RIVER, ATCHAFALAYA AND BAYOU BOEUF LEVEE DISTRICT.

River, Atchafalaya and Bayou Boeuf Levee District under five contracts contracts of earlier date not completed April 2,1 1902.

| EXCAVATION | | | | |
|---|---|---|---|---|
| Cubic Yards | Cost | Cost Clearing | Total Cost | REMARKS |
| 465,930 | 46,360.03 | $ 14,933.00 | 61,293.03 | |
| 175,000 | 25,375.00 | 29,400.00 | 54,775.00 | |
| 670,000 | 56,950.00 | 26,300.00 | 83,250.00 | |
| 305,357 | 27,482.13 | 19,243.52 | 46,725.65 | |
| 70,000 | 6,300.00 | 7,700.00 | 14,000.00 | |
| 1,686,287 | 162,467.16 | 97,576.52 | 260,043.68 | |
| 796,000 | 79,775.00 | 72,017.32 | 151,792.32 | |
| 890,287 | 82,692.16 | 25,559.20 | 108,251.36 | |
| 459,000 | 40,280.00 | 29,769.32 | 70,049.32 | |
| 337,000 | 39,495.00 | 42,248.00 | 81,743.00 | |
| 796,000 | 79,775.00 | 72,017.32 | 151,792.32 | |

## No. 13. ATCHAFALAYA BASIN AND LAFOURCHE LEVEE DISTRICTS.

Commissioners of the Atchafaloya Basin and Lafourch Levee Districts from April 21, 1902 to April 20, 1904.

| EXCAVATION | | |
|---|---|---|
| Cubic Yards | Cost | REMARKS |
| 38,614 | 15,566.04 | |
| 163,369 | 26,139.04 | |
| 75,921 | 12,147.36 | |
| 277,904 | 53,852.44 | |

## APPENDIX A. STATEMENT

The Board of State Engineers is indebited to the Orleans Levee Board, Commissioners, under nine contracts, entered

| Number | NAME OF CONTRACT | Parish | DATE OF | | LINEAR FEET | | Cubic Yards |
|---|---|---|---|---|---|---|---|
| | | | Contract | Final Certificate | New Levee | Enlargement | |
| 1 | Reconstr'tion of Clouet to Pauline St | Orleans | Oct. 24, '02 | Mar. 27, '03 | ........ | 2,200 | 29,946 |
| 2 | Revetment Stanton to Beka st.... | | Sept. 20, '02 | Feb. 26, '03 | ........ | ........ | ........ |
| 3 | Orleans Enlargement and Revetment........................ | | Sept. 8, '03 | Feb. 23, '04 | ........ | 8,255 | 59,788 |
| 4 | Aurora Enlargement and Revetment ...................... | | Sept. 16, '03 | Mar. 18, '04 | ........ | 6,783 | 37,645 |
| 5 | Adams to Short st................ | | Sept. 18, '03 | Mar. 30, '04 | 1,495 | ........ | 83,030 |
| 6 | Algiers Point...................... | | Oct. 17, 03 | Dec. 14, '03 | ........ | 673 | 2,585 |
| 7 | Third District Repair............ | | Oct. 21, '03 | Jan. 20, '04 | ........ | ........ | ........ |
| 8 | Material for Third District Repair | | Sept. 16, '03 | Jan. 12, '04 | ........ | ........ | ........ |
| 9 | Repair to N. O. & N. E. R. R. Fruit Shed...................... | | Dec. 19, '03 | Jan. 29, '04 | ........ | ........ | ........ |
| | Totals.................... | | ............ | ............ | 1,495<br>0.28 mls | 17,911<br>3.39 mls | 212,994 |

No. 14. ORLEANS LEVEE DISTRICT.

for the following Statement of work undertaking by the Board of into from April 21, 1902 to April 20, 1904.

| Price—Cents | COST | Revetment Linear ft. | Pile—Bank Protection | | B. M. | Price Cents | Cost of Woodwork | TOTAL COST |
|---|---|---|---|---|---|---|---|---|
| | | | Linear ft. | Price per ft. of Pile Cents | | | | |
| 25.00 | $ 7,486.50 | ............ | 2,200 | 17.00 | 258,478 | 25.75 | $ 15,643.57 | $ 23,130.07 |
| ...... | ............... | 6,517 | .......... | ...... | 225,666 | 24.80 | 5,596.51 | 5,596.51 |
| 28.00 | 16,740.64 | 4,500 | .......... | ...... | 242,733 | 46.00 | 11,210.73 | 27,951.37 |
| 19¼ | 7,246.66 | 6,891 | .......... | ...... | 292,046 | 44.00 | 12,874.67 | 20,121.33 |
| 34.00 | 28,230.20 | 1,495 | .......... | ...... | 103,981 | 43.50 | 4,523.19 | 32,753.39 |
| 19½ | 504.07 | 480 | .......... | ...... | 18,964 | 32.00 | 606.97 | 1,111.04 |
| ...... | ............... | ............ | 500 | 9 2-5 | 148,000 | 10.50 | 5.225.13 | 5,225.13 |
| ...... | ............... | ............ | .......... | ...... | ......... | ...... | 4,952.35 | 4,952.35 |
| ...... | ............... | ............ | .......... | ...... | ......... | ...... | ............ | 2,565.58 |
| ...... | $ 60,208.07 | 19,883 | 2,700 | ...... | 1,289,868 | ...... | 64,198.79 | 123,406.77 |
| ...... | ............... | ............ | .......... | ...... | ......... | ...... | ............ | ............... |

APPENDIX A.

## STATEMENT

### RECAPITULATION.

| DISTRICT | MILES<br>New Levee | MILES<br>Enlargement |
|---|---|---|
| Tensas Basin Levee District | ......... | 4.17 |
| Fifth Louisiana Levee District | 7.54 | 28.89 |
| Atchafalaya Basin Levee District | 9.33 | 13.31 |
| Pontchartrain Levee District | 2.30 | 19.11 |
| LaFourche Basin Levee District | 4.23 | 10.94 |
| Grand Prairie Levee District | 2.66 | 0.14 |
| Plaquemines Parish East Bank Levee District | 6.75 | ......... |
| Caddo Levee District | 10.50 | 3.56 |
| Bossier Levee District | 6.17 | ......... |
| Red River, Atchafalaya and Bayou Bœuf Levee Dis't. | 0.91 | 4.26 |
| Orleans Levee District | 0.28 | 3.39 |
| Totals | 50.67 | 87.77 |

| DRAINAGE. | MILES<br>Excavation | MILES<br>Clearing |
|---|---|---|
| Red River, Atchafalaya and Bayou Bœuf Levee Dis't. | 30.01 | 22.54 |

| IMPROVING BAYOU LAFOURCHE. | MILES<br>New Levee | MILES<br>Excavation |
|---|---|---|
| Atchafalaya Basin and Lafourche Levee District | 0.08 | 14.50 |

No. 15. DISTRICT CONTRACTS

| Cubic Yards | Average Price (Cents) | | Cost | REMARKS |
|---|---|---|---|---|
| 309,156 | 28.16 | | $ 96,715 16 | |
| 2,313,912 | 23.38 | | 540,945 25 | |
| 1,544,697 | 20.36 | | 314,573 28 | |
| 794,586 | 18.98 | | 150,808 05 | |
| 957,170 | 20.43 | | 195,524 01 | |
| 32,789 | 11.57 | | 3,793 31 | |
| 173,155 | 9.25 | | 16,016 84 | |
| 831,773 | 15.80 | | 132,077 66 | |
| 498,425 | 17.60 | | 87,733 80 | |
| 237,676 | 20.86 | | 49,582 93 | |
| 212,994 | 28.26 | | 60,208 07 | |
| 7,906,333 | 20.84 | | $1,647,978 36 | |
| EXCA | VATION | Cost Clearing | Total Cost | |
| **Cubic Yards** | **Cost** | | | |
| 890,287 | $ 82,692 16 | $ 25,559 20 | $ 107,251 36 | |
| Cubic Yards | Cost | | | |
| 277,904 | $ 53,854 44 | | | |

## APPENDIX A. STATEMENT

The Board of State Engineers is indebted to the courtesy of Captain
following statement of levees built and enlarged by
Arkansas and Louisiana, from

| NAME OF CONTRACT | PARISH | DATE OF | | LINEAR FEET | |
|---|---|---|---|---|---|
| | | Contract | Final Certificate | New Levee | Enlargement |
| IN ARKANSAS. | | | | | |
| 2252 to 2533 | Chicot Co | Sep. 13, 1902 | Mar. 17, '04 | .......... | 28,100 |
| 3950 to 4080 | " " | Oct. 20, 1902 | Mar. 16, '03 | .......... | 13,000 |
| 4080 to 4210 | " " | Sep. 25, 1902 | Dec., 1903 | .......... | 13,000 |
| 2087 to 2121 | " " | Sep. 1, 1903 | Feb., 1904 | 3,400 | .......... |
| 2121 to 2164 | " " | Apr. 28, 1903 | Oct., 1903 | 4,300 | .......... |
| 0 to 62 plus 50 | " " | Sep. 23, 1903 | Feb. 10, 1904 | 6,250 | .......... |
| 2170 to 2185 | " " | Sep. 23, 1903 | Feb. 10, 1904 | 1,500 | .......... |
| Totals | .......... | .......... | .......... | 15,450<br>or 2.92 mls | 54,100<br>or 10.24 m |
| IN LOUISIANA. | | | | | |
| 190 to 256 | E. Carrol | Oct. 20, 1903 | .......... | .......... | 6,600 |
| 0 to 120 | " | Apr. 29, 1903 | Feb., 1904 | .......... | 12,000 |
| 120 to 190 | " | Apr. 28, 1903 | Nov., 1903 | .......... | 7,000 |
| Totals | .......... | .......... | .......... | .......... | 25,600<br>or 4.85 mls |

No. 16.

## UNITED STATES LEVEES.

E. W. Von Lucas, Corps of Engineers, United States Army, for the the United States, in the Upper Tensas District, in April 21, 1902, to April 20, 1904.

| Cubic Yards | Price—Cents | Cost | STREAM | REMARKS |
|---|---|---|---|---|
| 142,992 | 21½ | $ 30,743 29 | Mississippi Riv.. | |
| 82,639 | 16. | 13,222 24 | " " .. | |
| 99,360 | 19.7 | 19,573 92 | " " .. | |
| 141,145 | 15.7 | 22,159 76 | " " .. | |
| 145,589 | 16. | 23,294 24 | " " .. | |
| 180,852 | 19.35 | 34,994 86 | " " .. | Leland Spur $25,000.00, paid by Tensas Basin Levee Board. |
| 29,431 | 17.25 | 5,076 89 | " " .. | |
| 822,008 | ...... | $ 149,065 20 | | |
| .......... | ...... | ............ | | |
| 69,718 | 17.48 | $ 12,186 71 | Mississippi Riv.. | Compfeted, except slashing |
| 107,157 | 19.74 | 21,152 79 | " " .. | |
| 76,969 | 17.25 | 13,277 15 | " " .. | |
| 253,844 | ...... | $ 46,616 65 | | |
| .......... | ...... | ............ | | |

APPENDIX A. STATEMENT No. 17.

## UNITED STATES LEVEES.

The Board of State Engineers is indebted to the courtesy of Capt. Charles S. Bromwell, Corps of Engineers U. S. Army, for the following statement of levees built and enlarged by the United States, in the Fourth District, improving Mississipsi river from opposite Warrenton, Miss., to head of Passes, from April 20, 1902 to April 20, 1904.

### FIFTH LOUISIANA LEVEE DISTRICT.

| Name of Levee. | Miles below Cairo. | Length of line. | New or Enlgt. | Date of Completion. | Cubic Yardage. | Cost. |
|---|---|---|---|---|---|---|
| *Elk Ridge—* | | | | | | |
| Section 1.... | 630-R | 900 | Enlgt. | Feb. 8, 1904 | 12,881.48 | $ 3,186.88 |
| Section 2.... | 630-R | 900 | Enlgt. | Feb. 25, 1904 | 12,527.32 | 3,099.26 |
| Section 3.... | 630-R | 900 | Enlgt. | Feb. 25, 1904 | 12,100.00 | 2,993.54 |
| Section 4.... | 630-R | 900 | Enlgt. | Feb. 25, 1904 | 13,347.90 | 3,302.27 |
| Section 5.... | 630-R | 800 | Enlgt. | Feb. 25, 1904 | 13,371.58 | 3,308.13 |
| Section 6.... | 630-R | 800 | Enlgt. | Feb. 8, 1904 | 12,507.38 | 3,094.33 |
| *White Oak Lake, Lot 1—* | | | | | | |
| Section 1.... | 630-R | 800 | Enlgt. | Jan. 22, 1904 | 12,343.89 | 3,053.88 |
| Section 2.... | 630-R | 900 | Enlgt. | Jan. 29, 1904 | 13,463.18 | 3,330.79 |
| Section 3.... | 630-R | 1000 | Enlgt. | Feb. 3, 1904 | 13,251.46 | 3,278.41 |
| Section 4.... | 630-R | 900 | Enlgt. | Dec. 30, 1903 | 12,036.53 | 2,977.83 |
| Section 5.... | 631-R | 800 | Enlgt. | Dec. 23, 1903 | 11,786.85 | 2,916.07 |
| Section 6.... | 631-R | 800 | Enlgt. | Dec. 23, 1903 | 12,801.56 | 3,167.11 |
| *White Oak Lake, Lot 2—* | | | | | | |
| Section 1.... | 631-R | 800 | Enlgt. | Dec. 16, 1903 | 13,256.00 | 3,279.53 |
| Section 2.... | 631-R | 800 | Enlgt. | Dec. 16, 1903 | 12,688.82 | 3,139.21 |
| Section 3.... | 631-R | 800 | Enlgt. | Dec. 2, 1903 | 13,583.62 | 3,360.59 |
| Section 4.... | 631-R | 800 | Enlgt. | | | |
| Section 5.... | 631-R | 800 | Enlgt. | | | |
| Section 6.... | 631-R | 800 | Enlgt. | Apl. 5, 1904 | 11,566.84 | 2,861.64 |
| *White Oak Lake, Lot 3—* | | | | | | |
| Section 1.... | 632-R | 800 | Enlgt. | Mch. 30, 1904 | 11,864.02 | 2,935.16 |
| Section 2.... | 632-R | 800 | Enlgt. | Apl. 5, 1904 | 11,961.90 | 2,959.37 |
| Section 3.... | 632-R | 900 | Enlgt. | Feb. 5, 1904 | 12,837.30 | 3,175.95 |
| Section 4.... | 632-R | 1000 | Enlgt. | Jan. 22, 1904 | 13,069.19 | 3,233.32 |
| Section 5.... | 632-R | 1000 | Enlgt. | Dec. 20, 1903 | 13,600.43 | 3,364.75 |
| Section 6.... | 633-R | 900 | Enlgt. | Dec. 2, 1903 | 12,500.99 | 3,092.74 |
| *Southwood—* | | | | | | |
| Section 1.... | 633-R | 900 | Enlgt. | Oct. 17, 1903 | 12,370.78 | 3,060.53 |
| Section 2.... | 633-R | 900 | Enlgt. | Oct. 17, 1903 | 12,715.88 | 3,145.91 |
| Section 3.... | 633-R | 900 | Enlgt. | Sep. 24, 1903 | 12,872.47 | 3,184.65 |
| Section 4.... | 633-R | 900 | Enlgt. | Sep. 1, 1903 | 12,348.90 | 3,055.12 |
| Section 5.... | 633-R | 1000 | Enlgt. | Sep. 24, 1903 | 12,696.34 | 3,141.07 |
| Section 6.... | 633-R | 684 | Enlgt. | Sep. 24, 1903 | 10,976.57 | 2,715.60 |
| *Cane Brake—* | | | | | | |
| Section 1.... | 683-R | 835 | Enlgt. | Nov. 10, 1902 | 12,104.69 | 2,541.99 |
| Section 2.... | 683-R | 900 | Enlgt. | Dec. 10, 1902 | 13,465.57 | 2,827.77 |
| Section 3.... | 683-R | 600 | Enlgt. | Jan. 20, 1903 | 10,467.02 | 2,198.07 |
| Section 4.... | 683-R | 600 | Enlgt. | Mch. 2, 1903 | 10,821.99 | 2,274.72 |
| Section 5.... | 683-R | 700 | Enlgt. | Mch. 2, 1903 | 11,841.24 | 2,406.66 |
| Section 6.... | 683-R | 500 | Enlgt. | Nov. 22, 1902 | 11,263.75 | 2,365.38 |

FIFTH LOUISIANA LEVEE DISTRICT.— Continued.

| Name of Levee. | Miles below Cairo. | Length of line. | New or Enlgt. | Date of Completion. | Cubic Yardage. | Cost. |
|---|---|---|---|---|---|---|
| *Shamrock*— | | | | | | |
| Section 1.... | 684-R | 500 | Enlgt. | Nov. 10, 1902 | 10,661.96 | 2,239.02 |
| Section 2.... | 684-R | 500 | Enlgt. | Nov. 12, 1902 | 10,826.03 | 2,273.46 |
| Section 3.... | 684-R | 700 | Enlgt. | Dec. 9, 1902 | 12,076.16 | 2,535.99 |
| Section 4.... | 684-R | 700 | Enlgt. | Dec. 24, 1902 | 11,823.49 | 2,482.93 |
| Section 5.... | 684-R | 700 | Enlgt. | Mch. 4, 1903 | 11,437.45 | 2,401.87 |
| Section 6.... | 684-R | 1000 | Enlgt. | Jan. 20, 1903 | 12,769.13 | 2,681.52 |
| *Vancluse*— | | | | | | |
| Section 1.... | 685-R | 1000 | Enlgt. | Jan. 19, 1903 | 11,995.38 | 1,858.08 |
| Section 2.... | 685-R | 900 | Enlgt. | Jan. 19, 1903 | 11,378.99 | 1,762.61 |
| Section 3.... | 685-R | 900 | Enlgt. | Dec. 10, 1902 | 11,609.30 | 1,797.28 |
| Section 4.... | 685-R | 1100 | Enlgt. | Nov. 27, 1902 | 12,145.70 | 1,881.36 |
| Section 5.... | 685-R | 900 | Enlgt. | Oct. 30, 1902 | 11,072.18 | 1,715.08 |
| Section 6.... | 685-R | 919 | Enlgt. | Oct. 2, 1902 | 11,740.99 | 1,818.67 |
| Vancluse .... | 685-R | 500 | New | Jun. 30, 1903 | 7,459.13 | 1,154.67 |
| *Roseland*— | | | | | | |
| Section 1.... | 730-R | 1456 | Enlgt. | Mch. 7, 1903 | 12,222.82 | 1,405.62 |
| Section 2.... | 730-R | 1300 | Enlgt. | Mch. 4, 1903 | 13,055.84 | 1,501.42 |
| Section 3.... | 730-R | 1300 | Enlgt. | Jan. 17, 1903 | 12,120.23 | 1,393.82 |
| Section 4.... | 730-R | 1400 | Enlgt. | Feb. 10, 1903 | 12,653.55 | 1,455.15 |
| Section 5.... | 730-R | 1300 | Enlgt. | Jun. 6, 1903 | 11,993.39 | 1,379.24 |
| Section 6.... | 731-R | 1400 | Enlgt. | Jun. 10, 1903 | 12,665.94 | 1,456.58 |
| Section 7.... | 731-R | 1700 | Enlgt. | Feb. 10, 1903 | 13,665.81 | 1,571.56 |
| *Excelsior*— | | | | | | |
| Section 1.... | 732-R | 1600 | Enlgt. | Dec. 21, 1902 | 11,932.62 | 1,372.25 |
| Section 2.... | 732-R | 1400 | Enlgt. | Oct. 29, 1902 | 11,584.20 | 1,332.18 |
| Section 3.... | 732-R | 1500 | Enlgt. | Jan. 17, 1903 | 12,611.77 | 1,450.35 |
| Section 4.... | 732-R | 1600 | Enlgt. | Mch. 4, 1903 | 12,463.72 | 1,433.35 |
| Section 5.... | 732-R | 1100 | Enlgt. | Mch. 12, 1903 | 11,591.33 | 1,333.00 |
| Section 6.... | 733-R | 1200 | Enlgt. | Dec. 21, 1902 | 12,541.26 | 1,442.24 |
| Section 7.... | 733-R | 1440 | Enlgt. | Nov. 1, 1902 | 12,894.73 | 1,482.89 |
| *Wildwood*— | | | | | | |
| Section 1.... | 735-R | 1360 | Enlgt. | Nov. 28, 1903 | 14,941.02 | 1,897.51 |
| Section 2.... | 735-R | 1100 | Enlgt. | Jan. 4, 1903 | 11,503.97 | 1,461.00 |
| Section 3.... | 735-R | 1400 | Enlgt. | Dec. 29, 1903 | 12,743.58 | 1,618.43 |
| Section 4.... | 735-R | 1300 | Enlgt. | Apl. 25, 1903 | 12,487.27 | 1,385.89 |
| Section 5.... | 735-R | 1300 | Enlgt. | Apl. 25, 1903 | 12,781.89 | 1,623.30 |
| Section 6.... | 735-R | 1300 | Enlgt. | Mch. 3, 1904 | 17,579.53 | 2,232.60 |
| *Home Place*— | | | | | | |
| Section 1.... | 736-R | 1200 | Enlgt. | Dec. 21, 1902 | 12,681.02 | 1,458.31 |
| Section 2.... | 736-R | 700 | Enlgt. | Nov. 30, 1902 | 12,721.75 | 1,463.00 |
| Section 3.... | 736-R | 1000 | Enlgt. | Oct. 24, 1902 | 11,968.56 | 1,376.38 |
| Section 4.... | 736-R | 800 | Enlgt. | Feb. 12, 1903 | 13,249.46 | 1,513.88 |
| Section 5.... | 736-R | 900 | Enlgt. | Jun. 30, 1903 | 13,354.62 | 1,525.78 |
| Section 6.... | 736-R | 1268 | Enlgt. | Mch. 14, 1903 | 13,920.97 | 1,600.91 |
| *Ashland*— | | | | | | |
| Section 1.... | 738-R | 979 | Enlgt. | Oct. 29, 1902 | 11,089.19 | 1,275.25 |
| Section 2.... | 738-R | 1100 | Enlgt. | Nov. 27, 1902 | 12,004.29 | 1,380.49 |
| Section 3.... | 738-R | 1100 | Enlgt. | Dec. 2, 1902 | 12,140.16 | 1,396.12 |
| Section 4.... | 738-R | 1300 | Enlgt. | Dec. 10, 1902 | 10,424.21 | 1,198.78 |
| Section 5.... | 838-R | 1000 | Enlgt. | Oct. 23, 1902 | 11,206.64 | 1,288.76 |
| | | | | Totals ...... | 961,084.67 | $174,336.81 |

## Atchafalaya Basin Levee District.

| Name of Levee. | Miles below Cairo. | Length of line. | New or Enlgt. | Date of Completion. | Cubic Yardage. | Cost. |
|---|---|---|---|---|---|---|
| *Red River Landing—* | | | | | | |
| Section 1.... | 766-R | 1105 | Enlgt. | | | |
| Section 4.... | 766-R | 1100 | Enlgt. | Apl. 5, 1904 | 12,782.85 | $ 2,441.45 |
| *Smithland—* | | | | | | |
| Section 1.... | 767-R | 1183 | Enlgt. | Sep. 15, 1903 | 13,847.61 | 2,039.75 |
| Section 2.... | 767-R | 1300 | Enlgt. | Dec. 6, 1902 | 12,182.64 | 1,794.52 |
| Section 3.... | 767-R | 1000 | Enlgt. | Dec. 2, 1902 | 12,396.28 | 1,825.97 |
| Section 4.... | 767-R | 1300 | Enlgt. | Dec. 22, 1902 | 12,514.66 | 1,843.41 |
| Section 5.... | 767-R | 1200 | Enlgt. | Mch. 4, 1903 | 12,107.18 | 1,783.39 |
| Section 6.... | 767-R | 1200 | Enlgt. | Mch. 4, 1903 | 12,568.19 | 1,851.29 |
| *Torwood—* | | | | | | |
| Section 1.... | 875-R | 600 | New | Jan. 23, 1904 | 14,020.42 | 2,098.86 |
| Section 2.... | 875-R | 700 | New | Jan. 23, 1904 | 12,874.66 | 1,927.34 |
| *Lakeside—* | | | | | | |
| Section 1.... | 877-R | 675 | New | Dec. 29, 1903 | 13,496.81 | 2,020.47 |
| Section 2.... | 877-R | 584 | New | Dec. 18, 1903 | 12,802.19 | 1,916.49 |
| | | | | Totals ...... | 141,593.59 | $ 21,542.94 |

## Lafourche Basin Levee District.

| | | | | | | |
|---|---|---|---|---|---|---|
| *St. Clair—* | | | | | | |
| Section 1.... | 899-R | 1209 | Enlgt. | Oct. 30, 1903 | 11,697.67 | $ 1,900.87 |
| Section 2.... | 899-R | 1300 | Enlgt. | Nov. 12, 1903 | 11,859.45 | 1,927.16 |
| Section 3.... | 899.5-R | 1700 | Enlgt. | Nov. 19, 1903 | 12,003.64 | 1,950.50 |
| Section 4.... | 899.5-R | 1300 | Enlgt. | Nov. 27, 1903 | 11,373.19 | 1,848.48 |
| *St. Cecile—* | | | | | | |
| Section 1.... | 900-R | 900 | Enlgt. | Dec. 2, 1903 | 11,460.53 | 1,747.73 |
| Section 2.... | 900-R | 900 | Enlgt. | Dec. 11, 1903 | 12,077.98 | 1,841.89 |
| Section 3.... | 900.5-R | 1370 | Enlgt. | Jan. 4, 1904 | 12,349.58 | 1,883.31 |
| Section 4.... | 900.5-R | 1410 | Enlgt. | Dec. 28, 1903 | 11,875.31 | 1,810.98 |
| *St. James—* | | | | | | |
| Section 1.... | 904-R | 1312 | Enlgt. | Feb. 29, 1904 | 12,349.89 | 1,790.73 |
| Section 2.... | 904-R | 1300 | Enlgt. | Mch. 4, 1904 | 12,814.48 | 1,858.07 |
| Section 3.... | 904-R | 1300 | Enlgt. | Mch. 23, 1904 | 12,702.93 | 1,841.93 |
| Section 4.... | 904-R | 1100 | Enlgt. | Apl. 5, 1904 | 15,144.20 | 2,195.91 |
| *Concession—* | | | | | | |
| Section 1.... | 987-R | 2900 | Enlgt. | Feb. 12, 1903 | 12,285.19 | 1,812.06 |
| Section 2.... | 987-R | 2500 | Enlgt. | Sep. 10, 1903 | 13,115.68 | 1,934.56 |
| Section 3.... | 987-R | 2140 | Enlgt. | Sep. 10, 1903 | 12,521.18 | 1,846.87 |
| | | | | Totals ...... | 185,630.90 | $ 28,191.05 |

## BURAS LEVEE DISTRICT.

| Name of Levee. | Miles below Cairo. | Length of line. | New or Enlgt. | Date of Completion. | Cubic Yardage. | Cost. |
|---|---|---|---|---|---|---|
| Smith ...... | 1037-R | 2548 | New | Jan. 27, 1904 | 17,119.99 | $ 2,824.79 |
| **PONTCHARTRAIN LEVEE DISTRICT.** | | | | | | |
| *Virginia*— | | | | | | |
| Section 1.... | 863.5-R | 1120 | Enlgt. | Sep. 5, 1902 | 12,899.42 | $ 1,789.79 |
| Section 2.... | 863.5-L | 1200 | Enlgt. | Sep. 5, 1902 | 12,959.26 | 1,798.09 |
| Section 3.... | 863.5-L | 1100 | Enlgt. | Nov. 19, 1902 | 12,577.45 | 1,745.12 |
| Section 4.... | 863.5-L | 1000 | Enlgt. | Dec. 4, 1902 | 12,923.73 | 1,993.17 |
| Section 5.... | 863.5-L | 1000 | Enlgt. | Oct. 20, 1902 | 12,370.26 | 1,716.37 |
| Section 6.... | 863.5-L | 1210 | Enlgt. | Sep. 24, 1902 | 13,506.58 | 1,874.04 |
| *Ophelia*— | | | | | | |
| Section 1.... | 865-L | 738 | Enlgt. | Oct. 28, 1902 | 10,577.24 | 1,467.59 |
| Section 2.... | 865-L | 800 | Enlgt. | Nov. 17, 1902 | 11,065.47 | 1,535.33 |
| Section 3.... | 865-L | 742 | Enlgt. | Feb. 17, 1903 | 11,143.02 | 1,546.09 |
| *Gem*— | | | | | | |
| Section 1.... | 881-L | 710 | Enlgt. | Oct. 30, 1902 | 12,903.17 | 1,999.99 |
| Section 2.... | 881-L | 1000 | Enlgt. | Nov. 22, 1902 | 12,920.77 | 2,002.72 |
| Section 3.... | 881-L | 1200 | Enlgt. | Dec. 26, 1902 | 13,201.84 | 2,046.29 |
| Section 4.... | 881-L | 1200 | Enlgt. | Jan. 12, 1903 | 12,889.46 | 1,997.87 |
| Section 5.... | 881-L | 1300 | Enlgt. | Oct. 2, 1902 | 13,854.25 | 2,147.41 |
| *Eighty-one Mile Point*— | | | | | | |
| Section 3.... | 883-L | 1200 | Enlgt. | Feb. 4, 1903 | 13,307.88 | 1,795.23 |
| Section 4.... | 883-L | 1100 | Enlgt. | Jan. 24, 1900 | 13,047.09 | 1,760.05 |
| Section 5.... | 883-L | 1012 | Enlgt. | Jan. 2, 1903 | 13,856.54 | 1,869.24 |
| Section 1.... | 883-L | 1100 | Enlgt. | Jan. 16, 1904 | 13,374.17 | 1,860.17 |
| Section 2.... | 883-L | 1300 | Enlgt. | Jan. 16, 1904 | 13,673.18 | 1,840.16 |
| *St. Mary Chapel*— | | | | | | |
| Section 1.... | 895-L | 1200 | Enlgt. | Aug. 7, 1902 | 11,886.31 | 1,307.39 |
| Section 2.... | 895-L | 1200 | Enlgt. | Aug. 7, 1902 | 12,167.96 | 1,338.48 |
| Section 3.... | 895-L | 1000 | Enlgt. | Jul. 24, 1902 | 10,604.98 | 1,166.55 |
| Section 4.... | 895-L | 900 | Enlgt. | Jul. 3, 1902 | 11,082.24 | 1,210.05 |
| Section 5.... | 895-L | 900 | Enlgt. | Jul. 12, 1902 | 9,901.89 | 1,089.21 |
| *Whitehall*— | | | | | | |
| Section 1.... | 896-L | 1200 | Enlgt. | Feb. 13, 1903 | 12,777.51 | 1,645.74 |
| Section 2.... | 896-L | 900 | Enlgt. | Feb. 2, 1903 | 12,086.55 | 1,556.74 |
| Section 3.... | 896-L | 1200 | Enlgt. | Jan. 15, 1903 | 12,985.62 | 1,672.55 |
| Section 4.... | 896-L | 900 | Enlgt. | Jan. 9, 1903 | 12,561.10 | 1,617.87 |
| Section 5.... | 896-L | 900 | Enlgt. | Jan. 9, 1903 | 12,007.03 | 1,546.50 |
| *Alta Villa*— | | | | | | |
| Section 1.... | 898-L | 1000 | Enlgt. | Nov. 24, 1902 | 12,106.53 | 1,604.12 |
| Section 2.... | 898-L | 1000 | Enlgt. | Nov. 13, 1902 | 13,020.85 | 1,725.26 |
| Section 3.... | 898-L | 1000 | Enlgt. | Nov. 1, 1902 | 12,694.80 | 1,682.06 |
| Section 4.... | 898-L | 1100 | Enlgt. | Oct. 25, 1902 | 14,047.54 | 1,861.30 |
| Section 5.... | 898-L | 1100 | Enlgt. | Oct. 9, 1902 | 12,985.86 | 1,720.63 |
| *Rapidan*— | | | | | | |
| Section 1.... | 899-L | 1200 | Enlgt. | Sep. 29, 1902 | 13,969.57 | 1,850.97 |
| Section 2.... | 899-L | 1000 | Enlgt. | Sep. 13, 1902 | 12,882.38 | 1,720.17 |
| Section 3.... | 899-L | 1000 | Enlgt. | Sep. 2, 1902 | 12,305.81 | 1,630.52 |
| Section 4.... | 899-L | 1200 | Enlgt. | Aug. 20, 1902 | 13,997.30 | 1,854.64 |
| Section 5.... | 899-L | 1138 | Enlgt. | Aug. 5, 1902 | 13,267.96 | 1,758.00 |
| *Uncle Sam*— | | | | | | |
| Section 1.... | 901-L | 1225 | Enlgt. | Sep. 26, 1903 | 12,341.28 | 1,569.81 |
| Section 2.... | 901-L | 1200 | Enlgt. | Oct. 10, 1903 | 12,218.16 | 1,554.15 |
| Section 3.... | 901-L | 1278 | Enlgt. | Oct. 27, 1903 | 12,646.68 | 1,608.66 |
| Section 4.... | 901-L | 1100 | Enlgt. | Sep. 16, 1903 | 10,573.33 | 1,344.93 |
| Section 5.... | 901-L | 1300 | Enlgt. | Nov. 27, 1903 | 12,773.47 | 1,624.78 |

Pontchartrain Levee District.—Continued.

| Name of Levee. | Miles below Cairo. | Length of line. | New or Enlgt. | Date of Completion. | Cubic Yardage. | Cost. |
|---|---|---|---|---|---|---|
| *Como—* | | | | | | |
| Section 1.... | 902-L | 778 | New | Aug. 31, 1903 | 13,430.91 | 1,746.02 |
| Section 2.... | 902-L | 612 | New | Aug. 31, 1903 | 12,326.43 | 1,602.44 |
| *Convent—* | | | | | | |
| Section 1.... | 903-L | 1300 | Enlgt. | Oct. 28, 1903 | 12,734.10 | 1,776.41 |
| Section 2.... | 903-L | 1200 | Enlgt. | Jan. 10, 1904 | 11,571.07 | 1,614.16 |
| Section 3.... | 903-L | 1200 | Enlgt. | Dec. 24, 1903 | 12,233.59 | 1,706.58 |
| Section 4.... | 903-L | 1200 | Enlgt. | Sep. 26, 1903 | 12,231.24 | 1,706.26 |
| Section 5.... | 903-L | 1253 | Enlgt. | Nov. 4, 1903 | 11,768.97 | 1,641.77 |
| *Thibodaux—* | | | | | | |
| Section 1.... | 903.5-L | 542 | New | Sep. 2, 1903 | 13,532.01 | 1,887.71 |
| Section 2.... | 903.5-L | 516 | New | Sep. 2, 1903 | 12,127.53 | 1,691.79 |
| *College Point—* | | | | | | |
| Section 1.... | 904-L | 1200 | Enlgt. | Oct. 3, 1903 | 11,078.29 | 1,545.42 |
| Section 2.... | 904-L | 1400 | Enlgt. | Dec. 14, 1903 | 12,977.73 | 1,810.39 |
| Section 3.... | 904-L | 1200 | Enlgt. | Jan. 14, 1904 | 11,057.77 | 1,542.56 |
| *Poche—* | | | | | | |
| Section 1.... | 911-L | 1298 | Enlgt. | Aug. 4, 1903 | 10,127.63 | 1,288.23 |
| Section 2.... | 911-L | 1300 | Enlgt. | Sep. 7, 1903 | 10,496.44 | 1,335.15 |
| Section 3.... | 911-L | 1300 | Enlgt. | Sep. 24, 1903 | 10,428.51 | 1,326.51 |
| Section 4.... | 911-L | 1466 | Enlgt. | Aug. 7, 1903 | 9,873.64 | 1,255.93 |
| *St. Joseph Church—* | | | | | | |
| Section 1.... | 912-L | 1534 | Enlgt. | Nov. 3, 1903 | 11,857.13 | 1,508.23 |
| Section 2.... | 912-L | 1100 | Enlgt. | Dec. 8, 1903 | 11,833.31 | 1,505.19 |
| Section 3.... | 912-L | 700 | New | Jan. 8, 1904 | 12,528.59 | 1,593.63 |
| Section 4.... | 912-L | 600 | New | Feb. 17, 1904 | 11,366.49 | 1,445.81 |
| Section 5.... | 912-L | 1180 | Enlgt. | Nov. 4, 1903 | 11,374.11 | 1,446.78 |
| *Golden Grove—* | | | | | | |
| Section 1.... | 914.5-L | 1200 | Enlgt. | Sep. 6, 1902 | 10,778.93 | 1,428.21 |
| Section 2.... | 914.5-L | 1200 | Enlgt. | Jan. 3, 1902 | 10,778.26 | 1,430.77 |
| Section 3.... | 914.5-L | 1200 | Enlgt. | Sep. 24, 1902 | 10,423.52 | 1,381.11 |
| Section 4.... | 914.5-L | 1200 | Enlgt. | Oct. 2, 1902 | 10,628.11 | 1,408.23 |
| Section 5.... | 914.5-L | 1200 | Enlgt. | Oct. 10, 1902 | 10,632.03 | 1,408.74 |
| *Sport—* | | | | | | |
| Section 1.... | 915-L | 1100 | Enlgt. | Oct. 31, 1902 | 10,426.67 | 1,381.53 |
| Section 2.... | 915-L | 1200 | Enlgt. | Nov. 15, 1902 | 10,103.08 | 1,338.66 |
| Section 3.... | 915-L | 1000 | Enlgt. | Nov. 15, 1902 | 10,120.39 | 1,340.95 |
| Section 4.... | 915-L | 1000 | Enlgt. | Nov. 29, 1902 | 10,531.45 | 1,395.42 |
| Section 5.... | 915-L | 1000 | Enlgt. | Dec. 13, 1902 | 11,076.66 | 1,467.66 |
| *Mt. Airy—* | | | | | | |
| Section 1.... | 916-L | 900 | Enlgt. | Dec. 23, 1902 | 9,680.38 | 1,282.65 |
| Section 2.... | 916-L | 1100 | Enlgt. | Dec. 30, 1902 | 11,218.20 | 1,486.41 |
| Section 3.... | 916-L | 800 | Enlgt. | Jun. 3, 1903 | 10,000.56 | 1,325.07 |
| Section 4.... | 916-L | 800 | Enlgt. | Jun. 3, 1903 | 10,189.75 | 1,380.44 |
| Section 5.... | 916-L | 800 | Enlgt. | Jun. 3, 1903 | 10,461.44 | 1,386.15 |
| *Laplace—* | | | | | | |
| Section 1.... | 927-L | 1800 | Enlgt. | Dec. 16, 1903 | 13,174.87 | 1,675.84 |
| Section 2.... | 927-L | 1800 | Enlgt. | Oct. 31, 1903 | 11,738.02 | 1,493.08 |
| Section 3.... | 927-L | 2000 | Enlgt. | Feb. 3, 1904 | 12,820.62 | 1,630.78 |
| Section 4.... | 927-L | 2100 | Enlgt. | Mch. 15, 1904 | 13,051.82 | 1,660.10 |
| Section 5.... | 927-L | 2190 | Enlgt. | Sep. 19, 1903 | 11,199.63 | 1,424.59 |
| *Belmont—* | | | | | | |
| Section 4.... | 908-L | 1100 | Enlgt. | Apl. 4, 1904 | 14,289.97 | 2,485.29 |
| *Hester—* | | | | | | |
| Section 3.... | 909-L | 1400 | Enlgt. | Apl. 5, 1904 | 11,135.51 | 2,054.50 |
| | | | | Totals ...... | 1,044,358.86 | $140,288.95 |

### LAKE BORGNE DISTRICT.

| Name of Levee. | Miles below Cairo. | Length of line. | New or Enlgt. | Date of Completion. | Cubic Yardage. | Cost. |
|---|---|---|---|---|---|---|
| *Scarsdale*— | | | | | | |
| Section 1.... | 985-L | 700 | New | Oct. 23, 1902 | 11,917.12 | $ 1,817.36 |
| Section 2.... | 985-L | 800 | New | Sep. 29, 1902 | 13,674.58 | 2,085.38 |
| Section 3.... | 985-L | 836 | New | Sep. 4, 1902 | 13,683.43 | 2,086.73 |
| *Savoie*— | | | | | | |
| Section 1.... | 1008-L | 2900 | Enlgt. | Aug. 27, 1902 | 13,550.20 | 1,930.90 |
| Section 2.... | 1008-L | 2754 | Enlgt. | Oct. 6, 1902 | 13,601.31 | 1,938.19 |
| | | | | Totals ...... | 66,426.64 | $ 9,858.56 |

### GRAND PRAIRIE LEVEE DISTRICT.

| Name of Levee. | Miles below Cairo. | Length of line. | New or Enlgt. | Date of Completion. | Cubic Yardage. | Cost. |
|---|---|---|---|---|---|---|
| *Louderbough*— | | | | | | |
| Section 1.... | 1024-L | 1938 | New | Dec. 23, 1903 | 14,409.02 | $ 2,545.59 |
| Section 2.... | 1024-L | 2250 | New | Dec. 23, 1903 | 14,951.15 | 2,641.37 |
| Section 3.... | 1024-L | 1564 | New | Dec. 23, 1903 | 14,273.17 | 2,521.49 |
| | | | | Totals ...... | 43,633.34 | $ 7,708.55 |

APPENDIX A. STATEMENT

RECAPITULATION

| DISTRICTS | MILES | |
|---|---|---|
| | New Levee | Enlargement |
| In Arkansas | 2.92 | 10.24 |
| In Louisiana— | | |
| Fifth Louisiana, Upper Tensas | ............ | 4.85 |
| Fifth Louisiana, Lower Tensas | 0.10 | 14.89 |
| Atchafalaya Basin | 0.48 | 1.76 |
| Pontchartrain | 0.71 | 17.88 |
| Lafourche Basin | ............ | 4.29 |
| Lake Borgne | 0.44 | 1.07 |
| Grand Prairie | 1.09 | ............ |
| Buras | 0.48 | ............ |
| Totals | 6.22 | 54.98 |

No. 18. UNITED STATES LEVEES.

| Cubic Yards | Cost | | REMARKS |
|---|---|---|---|
| 822,008 | $149,065 | 20 | |
| 253,844 | 46,616 | 65 | |
| 961,085 | 174,336 | 81 | |
| 141,594 | 21,542 | 94 | |
| 1,044,359 | 140,288 | 95 | |
| 185,631 | 28,191 | 05 | |
| 66,427 | 9,858 | 56 | |
| 43,633 | 7,708 | 55 | |
| 17,120 | 2,824 | 79 | |
| 3,535,701 | $580,433 | 50 | |

APPENDIX A. STATEMENT

Approximate quantities and cost of levee work in the several levee dis-
April 21, 1902, to April 20, 1904, by the District, State and

| NAME OF DISTRICT | BY WHOM DONE | ILES OF | |
|---|---|---|---|
| | | New Levee | Enlargement |
| Arkansas | Tensas Basin Levee District | .......... | 4.17 |
| | United States | 2.92 | 10.24 |
| | Totals | 2.92 | 14.41 |
| In Louisiana—<br>Fifth Louisiana Levee District | District | 7.54 | 28.89 |
| | State | 10.42 | 9.53 |
| | United States UpTensas | .......... | 4.85 |
| | United States LrTensas | 0.10 | 14.89 |
| | Totals | 18.06 | 58.16 |
| Atchafalaya Basin Levee District | District | 9.33 | 13.31 |
| | State | 0.72 | 4.97 |
| | United States | 0.48 | 1.76 |
| | Totals | 10.53 | 20.04 |
| Pontchartrain Levee District | District | 2.30 | 19.11 |
| | State | 1.16 | .......... |
| | United States | 0.71 | 17.88 |
| | Totals | 4.17 | 36.99 |
| Lafourche Basin Levee District | District | 4.23 | 10.94 |
| | State | 0.47 | 5.02 |
| | United States | .......... | 4.29 |
| | Totals | 4.70 | 20.25 |
| Orleans Levee District | District | 0.28 | 3.39 |
| | Totals | 0.28 | 3.39 |
| Lake Borgne Levee District | State | 0.27 | 2.76 |
| | United States | 0.44 | 1.07 |
| | Totals | 0.71 | 3.83 |
| Grand Prairie Levee District | District | 2.66 | 0.14 |
| | State | 4.46 | 3.14 |
| | United States | 1.09 | .......... |
| | Totals | 8.21 | 3.28 |
| Buras Levee District | State | 1.28 | 0.97 |
| | United States | 0.48 | .......... |
| | Totals | 1.76 | 0.97 |
| Plaquemines Parish East Bank Levee Dist. | District | 6.75 | .......... |
| | Totals | 6.75 | .......... |

## No. 19. SUMMARY ACCORDING TO DISTRICTS.

tricts of Louisiana, and in Desha and Chicot counties, Arkansas, from United States, as shown in the foregoing statements.

| Cubic Yards | Average price per cubic yard—Cents | COST | REMARKS |
|---|---|---|---|
| 309,156 | 28.16 | $96,715 16 | |
| 822,008 | | 149,065 20 | |
| 1,131,164 | | $245,780 36 | |
| 2,313,912 | 23.38 | $540,945 25 | |
| 827,447 | 14.95 | 123,769 01 | |
| 253,844 | | 46,616 65 | |
| 961,085 | | 174,335 81 | |
| 4,356,288 | | $885,667 72 | |
| 1,544,697 | 20.36 | $314,573 28 | |
| 325,960 | 16.03 | 52,263 77 | |
| 141,594 | | 21,542 94 | |
| 2,012,251 | | $388,379 99 | |
| 794,586 | 18.98 | $150,808 05 | |
| 269,139 | 18.50 | 49,790 71 | |
| 1,044,359 | | 140,288 95 | |
| 2,108,084 | | $340,887 71 | |
| 957,170 | 20 43 | $195,524 01 | |
| 143,394 | 27.56 | 39,525 39 | |
| 185,631 | | 28,191 05 | |
| 1,286,195 | | $263,240 45 | |
| 212,994 | 28.26 | 60,208 07 | |
| 212,994 | | $60,208 07 | |
| 70,903 | 17.27 | $12,244 45 | |
| 66,427 | | 9,858 56 | |
| 137,330 | | $22,103 01 | |
| 32,789 | 11.57 | $3,793 31 | |
| 109,956 | 13.56 | 15,019 90 | |
| 43,633 | | 7,708 55 | |
| 186,378 | | $26,521 76 | |
| 58,283 | 17.53 | 10,216 51 | |
| 17,120 | | 2,824 79 | |
| 75,40 | | $13,041 30 | |
| 173,155 | 9.24 | $16,016 84 | |
| 173,155 | | $16,016 84 | |

## APPENDIX A. STATEMENT

| NAME OF DISTRICT | BY WHOM DONE | MILES | |
|---|---|---|---|
| | | New Levee | Enlargement |
| Caddo Levee District | District | 10.50 | 3.56 |
| | State | 2.72 | 0.02 |
| | Totals | 13.22 | 3.58 |
| Bossier Levee District | District | 6.17 | ............ |
| | State | 3.55 | 1.00 |
| | Totals | 9.72 | 1.00 |
| Red River, Atchafalaya and Bayou Bœuf Levee District | District | 0.91 | 4.26 |
| | State | 0.08 | 9.18 |
| | Totals | 0.99 | 13.44 |
| **RECAPITULATION** | | | |
| In Arkansas | | 2.92 | 14.41 |
| In Louisiana— | | | |
| Fifth Louisiana Levee District | | 18.06 | 58.16 |
| Atchafalaya Basin Levee District | | 10.53 | 20.04 |
| Pontchartrain Levee District | | 4.17 | 36.99 |
| Lafourche Basin Levee District | | 4.70 | 20.25 |
| Orleans Levee District | | 0.28 | 3.39 |
| Lake Borgne Levee District | | 0.71 | 3.83 |
| Grand Prairie Levee District | | 8.21 | 3.28 |
| Buras Levee District | | 1.76 | 0.97 |
| Plaquemines Parish East Bank Levee District | | 6.75 | ... |
| Bossier Levee District | | 9.72 | 1.00 |
| Caddo Levee District | | 13.22 | 3.58 |
| Red River, Atchafalaya and Bayou Bœuf Levee District | | 0.99 | 13.44 |
| Totals | | 82.02 | 179.34 |
| By the Districts | | 50.67 | 87.77 |
| By the State | | 25.13 | 36.59 |
| By the United States | | 6.22 | 54.98 |
| Totals | | 82.02 | 179.34 |

## No. 19.—Cont'd. SUMMARY ACCORDING TO DISTRICTS.

| Cubic Yards | Average price per cubic yard—Cents | COST | REMARKS |
|---|---|---|---|
| 831,773 | 15.80 | $132,077 66 | |
| 213,025 | 19.20 | 40,994 71 | |
| 1,044,798 | | $173,072 37 | |
| 498,425 | 17.60 | $87.733 80 | |
| 392.374 | 15.75 | 61.813 95 | |
| 890,799 | | $149,547 75 | |
| 237,676 | 20.86 | $49,582 93 | |
| 226,888 | 19.39 | 43,981 75 | |
| 464,564 | | $93,564 68 | |
| 1,131,164 | | $245,780 36 | |
| 4,356,288 | | 885,667 72 | |
| 2,012,251 | | 388,379 99 | |
| 2,108,084 | | 340.887 71 | |
| 1,286,195 | | 263,240 45 | |
| 212,994 | | 60,208 07 | |
| 137,330 | | 22,103 01 | |
| 186,378 | | 26,521 76 | |
| 75,403 | | 13,041 30 | |
| 173,155 | | 16,016 84 | |
| 890,799 | | 149,547 75 | |
| 1,044,798 | | 173,072 37 | |
| 464.564 | | 93,564 68 | |
| 14,079,403 | | 2.678,032 01 | |
| 7,906,333 | | 1,647,978 36 | |
| 2,637,369 | | 449,620 15 | |
| 3,535,701 | | 580.433 50 | |
| 14,079,403 | | 2,678,032 01 | |

## APPENDIX A. STATEMENT

Approximate quantities and cost of levee work in the several Levee Dis-
April 21, 1902, to April 20, 1904, by the Districts, State and

| STREAM | LEVEE DISTRICT | BY WHOM DONE | MILES OF | |
|---|---|---|---|---|
| | | | New Levee | Enlargement |
| Mississippi River in Arkansas | Tensas Basin | District | .......... | 4.17 |
| | | United States | 2.92 | 10.24 |
| | | Totals | 2.92 | 14.41 |
| Mississippi River in Louisiana | Fifth Louisiana | District | 7.54 | 28.89 |
| | | State | 10.42 | 9.53 |
| | | United States | 0.10 | 19.74 |
| | Atchafalaya Basin | District | 2.52 | 12.30 |
| | | State | 0.72 | 4.97 |
| | | United States | 0.48 | 1.76 |
| | Pontchartrain | District | 2.30 | 19.11 |
| | | State | 1.16 | .......... |
| | | United States | 0.71 | 17.88 |
| | Lafourche Basin | District | 4.23 | 9.30 |
| | | State | 0.47 | 5.02 |
| | | United States | .......... | 4.29 |
| | Orleans | District | 0.28 | 3.39 |
| | Lake Borgne Basin | State | 0.27 | 2.76 |
| | | United States | 0.44 | 1.07 |
| | Grand Prairie | District | 2.66 | 0.14 |
| | | State | 4.46 | 3.14 |
| | | United States | 1.09 | .......... |
| | Buras | State | 1.28 | 0.97 |
| | | United States | 0.48 | .......... |
| | | Totals | 41.61 | 144.26 |
| Red River | Caddo | District | 10.50 | 3.56 |
| | | State | 2.72 | 0.02 |
| | Bossier | District | 6.17 | .......... |
| | | State | 3.55 | 1.00 |
| | R. R. A. and B. B | State | .......... | 6.28 |
| | | Totals | 22.94 | 19.90 |
| Bayou des Glaizes | R. R., A. and B. B. | District | .......... | 0.63 |
| | | State | 0.08 | 2.77 |
| | | Totals | 0.08 | 3.40 |
| Atchafalapa River | R. R., A. and B. B | District | 0.91 | 3.63 |
| | Atchafalaya Basin | District | 6.68 | 0.31 |
| | | Totals | 7.59 | 3.94 |

## No. 20. SUMMARY ACCORDING TO STREAMS.

tricts of Louisiana, and in Desha and Chicot counties, Arkansas, from United States, as shown in the foregoing statements.

| Cubic Yards | Cost | REMARKS |
|---:|---:|---|
| 309,156 | $96,715.16 | |
| 822,008 | 149,065.20 | |
| 1,131,164 | $245,780.36 | |
| 2,313,912 | $540,945.25 | |
| 827,447 | 123,769,01 | |
| 1,214,929 | 220,953.46 | |
| 1,057'873 | 222,482.22 | |
| 325,960 | 52,263.77 | |
| 141,594 | 21,542.94 | |
| 794,586 | 150,808.05 | |
| 269,139 | 49,790.71 | |
| 1,044,359 | 140,288.95 | |
| 892,635 | 179,642.83 | |
| 143,394 | 39,525,39 | |
| 185,631 | 28,191.05 | |
| 212,994 | 60,208.07 | |
| 70,903 | 12,244.45 | |
| 66,427 | 9,858.56 | |
| 32,789 | 3,793.31 | |
| 109,956 | 15,019.90 | |
| 43,633 | 7,708.55 | |
| 58,283 | 10,216.51 | |
| 17,120 | 2,824.79 | |
| 9,823,564 | $1,892,077.77 | |
| 831,773 | $132,077.66 | |
| 213,025 | 40,994.71 | |
| 498,425 | 87,733.80 | |
| 392,374 | 61,813.95 | |
| 162,369 | 32,929.04 | |
| 2,097,966 | $355,549.16 | |
| 15,197 | $2,857.03 | |
| 61,198 | 9,458.63 | |
| 76,395 | $12,315.66 | |
| 222,479 | $46,725.90 | |
| 455,039 | 86,715.41 | |
| 677,518 | $133,441.31 | |

APPENDIX A. STATEMENT

| STREAM | LEVEE DISTRICT | BY WHOM DONE | MILES OF New Levee | MILES OF Enlarsement |
|---|---|---|---|---|
| Bayou Lafourche.... | Atchafalaya Basin.... | District............... | 0.13 | 0.70 |
| | Lafourche Basin....... | District............... | .......... | 1.64 |
| | | Totals.......... | 0.13 | 2.34 |
| Bayou Rapides........ | R. R., A. and B. B.... | State.................. | .......... | 0.13 |
| Gulf Coast........... | Plaquemines Parish East Bank .... | District............... | 6.75 | .......... |

RECAPITULATION.

| | New Levee | Enlarsement |
|---|---|---|
| Mississippi River (in Arkansas)........................................ | 2.92 | 14.41 |
| Mississippi River (in Louisiana)........................................ | 41.61 | 144.26 |
| Red River........................................................ | 22.94 | 10.86 |
| Bayou des Glaizes................................................ | 0.08 | 3.40 |
| Atchafalaya River ............................................... | 7.59 | 3.94 |
| Bayou Lafourche.................................................. | 0.13 | 2.34 |
| Bayou Rapides.................................................... | .......... | 0.13 |
| Gulf Coast....................................................... | 6.75 | .......... |
| Totals ............................................ | 82.02 | 179.34 |

No. 20.—Cont'd. SUMMARY ACCORDING TO STREAMS.

| Cubic Yards | Cost | REMARKS |
|---|---|---|
| 31,785 | $5,375.65 | |
| 64,535 | 15,881.18 | |
| 96,320 | $21,256.83 | |
| 3,321 | $1,594.08 | |
| 173,155 | $16,016.84 | |
| 1,131,164 | $245,780.36 | |
| 9,823,564 | 1,892,077.77 | |
| 2,097,966 | 355,549.16 | |
| 76,395 | 12,315.66 | |
| 677,518 | 133,441.31 | |
| 96,320 | 21,256.83 | |
| 3,321 | 1,594.08 | |
| 173,155 | 16,016.84 | |
| 14,079,403 | $2,678,032.01 | |

APPENDIX A.

STATEMENT

GRAND

| DISTRICT | MILES<br>New Levee | <br>Enlargement |
|---|---|---|
| | LEVEE | |
| Districts | 50.67 | 87.77 |
| State | 25.13 | 35.59 |
| United States | 6.22 | 54.98 |
| Totals | 82.02 | 179.34 |

| DISTRICT | DRAIN<br>MILES<br>Excavation | <br><br>Clearing |
|---|---|---|
| Districts | 30.01 | 22.54 |

| DISTRICT | IMPROVING<br>MILES<br>New Levee | <br><br>Excavation |
|---|---|---|
| Districts | 0.08 | 14.50 |

No. 21.

## SUMMARY.

TOTAL,

| Cu. Yards | Cost | | Total Cost | REMARKS |
|---|---|---|---|---|
| **WORK** | | | | |
| 7,906,333 | $1,647,978.36 | | | |
| 2,637,369 | 449,620.15 | | | |
| 3,535,701 | 580,433.50 | | | |
| 14,079,403 | $2,678,032.01 | | $2,678,032.01 | |
| **AGE** | | | | |
| EXCAVATION | | Cost Clearing | | |
| Cu. Yrads | Cost | | | |
| 890,287 | $ 82,692.16 | 25,559.20 | 107,251.36 | |
| **BAYOU LAFOURCHE** | | | | |
| Cu. Yards | Cost | | | |
| 277,904 | $ 53,854.44 | | 53,854.44 | |
| | | Total . . . | $2,839,137.81 | |

# APPENDIX B.

COPIES OF SUNDRY SPECIAL REPORTS, ETC., FROM THE BOARD OF STATE ENGINEERS TO THE VARIOUS LEVEE BOARDS, AND TO OTHERS. ALSO STATEMENTS RELATIVE TO RESOURCES OF THE LEVEE DISTRICTS AND STATE FOR LEVEE PURPOSES, AND RELATIVE TO LENGTH OF LEVEE LINES AND HIGH WATER RECORDS.

# APPENDIX B.

## SUNDRY SPECIAL REPORTS TO COMMISSIONERS.

---

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., Sept. 19, 1902.

*Hon. J. Q. Graves, Prest., and Members Board of Commissioners,*
*Tensas Basin Levee District, Monroe, La.*

GENTLEMEN: In accordance with the request of the Police Jury of Caldwell Parish, of July 16, 1902, and your resolution of July 29th, that the Board of State Engineers be requested to have Sandy Bayou surveyed and ascertain what the cost of building a dike over it near the present location of your old dike at the road crossing to Columbia would be, and report same to your Board, I have the honor to submit the following report:

The work was surveyed under the direction of this office, on September 5th, and a sketch map of the survey is enclosed herewith. I also beg leave to submit a report from Mr. Selman on the subject, and to state that we have had cross-sections made and quantities computed. We find that on a basis of 24-ft. crown and 2½ to 1 side slopes this dike will contain 15,856 cubic yards, and will be 330 feet in length. Placing its cost at a reasonable price, say 15 cents per cubic yard, it will amount to $2,378 for the embankment.

Under the act creating your Board, you have a right to build levees for protection from overflow and as this bayou is connected with the Ouachita River at present, a considerable quantity of water escapes through it and no doubt aids in increasing the water in Bœuf River at high water in the Ouachita, and a dike would be of benefit to considerable lands and protect same from overflow from the Ouachita even when the river is not above a bank full stage.

I would, therefore, recommend that if a price within a reasonable limit can be obtained for the work, that the Police Jury of Caldwell Parish and your Board proceed to dike it on the section as recommended. A width of crown of 24 feet would be equal to a banquette and an ordinary crown of 8 feet. If you desire the construction notes for the work will be issued to whatever contractor obtains the work, and a regular contract such as is used for all levee work can be drawn up, and the Police Jury of Caldwell Parish and your Board can agree to pay so much towards the construction of the dike. The figures upon which the quantities are estimated are based on actual survey and stakes have been set throughout the whole length of the dike, so that no further survey is necessary for the work.

I would imagine, however, that a just proportion should be borne by the Police Jury of Caldwell Parish say not less than one-half and that they give your Board some guaranty as to the maintenance of the dike after its completion. It would be better to pass a resolution aiding the Police Jury of Caldwell Parish in the construction of the dike than undertaking it as your work, as Act No. 108 of the General Assembly of 1898 makes riding, driving, or hauling on the public levees of the State a misdemeanor, and you have no authority to go beyond the Act in permitting the use of any dike for a public road, when it is built by your Board.

Very respectfully,
M. P. Robertson,
*Assistant State Engineer.*

---

STATE OF LOUISIANA,
Office Board of State Engineers,
New Orleans, April 12th, 1904.

*To the President and Members of the Tensas Basin Levee Board.*

Gentlemen: The following works have been completed by your Board within the last season, and amounts expended thereon:

| | |
|---|---|
| Repair Lucca Loop and Opossum Fork Loop.. | $ 1,896.00 |
| Repair Panther Forest.................... | 2,982.00 |
| Repair Vaucluse ......................... | 2,016.00 |
| Repair Gaines to Panther Forest............ | 2,736.00 |
| Spur Levee Leland Neck.................. | 25,000.00 |
| Fulton Lake ............................ | 62,085.16 |
| | $96,715.16 |

These works have cost the Board the total sum of $96,715.16, and have resulted in greatly bettering the condition of the levee line upon which the Tensas Basin Levee Board is immediately dependent for protection.

The repair of Lucca Loop and Opossum Fork Loop consisted of restoration of weather wash and re-sodding. The repair of Panther Forest Short Line consisted of the excavation of a defective foundation and the refilling of same with good material, where the levee gave a great deal of trouble in 1903. The Vaucluse repair was of the same nature as that at Panther Forest. The repair of Gaines Landing to Panther Forest consisted in the topping, general repairing and overhauling of this important line of levee extending from Gaines Landing to Panther Forest Short Line. The Spur Levee at Leland Neck consisted in the construction of a spur dike on the river side of the levee out on the Leland Neck, and was for the purpose of preventing a cut-off that was imminently threatened. The Fulton Lake work consisted in river side enlargement of more than 4 miles of the important Fulton Lake levee, up to a grade four feet above the high water of 1897.

Your Board is to be congratulated upon the expedition with which all these works have been accomplished, and especially of the two works, Fulton Lake and Leland Spur.

The Fulton Lake levee has always been a source of anxiety to the people of the Tensas Basin, and we have been very fortunate in being able to put an enlargement throughout its entire length on the river side. This has been accomplished by the proper drainage of the pits and the remarkably dry season we have just passed. I hope that for the future the Fulton Lake Levee will cease to be a bug-bear to the people of the Tensas Basin, and I believe that we have now made it one of the best levees in the district.

The construction of the Leland Spur dike and the revetment of its end, by the United States Government, by the placing of mattresses and stone, will, no doubt, make this work hold, and thereby prevent that which was threatened, to-wit: a cut-off opposite the town of Greenville.

I congratulate the Board upon the hopeful outlook at present as regards high water, as it is not probable that the levees on this rise will be subjected to a severe test. I am also pleased to inform you that Capt. Lucas has retained asufficient amount of money for the purpose of putting the necessary inspectors, boats, and material in the Upper Tensas District in Arkansas, and that he is ready, should an emergency occur, to make a vigorous high water fight on the Arkansas levees. He did not state to me exactly the amount in hand, but from what he said I would infer that he has sufficient to meet the immediate needs.

At this time it is not necessary to make a project for future work in the Upper Tensas District in Arkansas, but it is reasonable to suppose that the work that is most important to you will be the construction of the two small loops at Chicot and Middle Places. These small loops will aggregate about 90,000 cubic yards, and I hope to see the Government undertake their construction. I believe that the Panther Forest Short Line may need a small loop this season, but these matters can be better taken up at a later date.

I congratulate your Board upon the zeal which it has always manifested in levee matters.

Respectfully,
M. P. Robertson,
*Assistant State Engineer.*

---

STATE OF LOUISIANA,
Office Board of State Engineers,
New Orleans, La., March 10, 1903.

*Hon. A. H. Gay, Prest. Board of Commissioners, Atchafalaya Basin Levee District, Plaquemine, La.*

Dear Sir: In order to comply with the resolution passed by the Atchafalaya Basin Levee Board at its last meeting, regarding the drainage of levees, I beg to submit the following, which is illustrated by the accompanying blue print:

First. A ditch should be dug parallel with the base of the levee, not nearer than three (3) feet from said base, which shall be two (2) feet wide at the top, one (1) foot wide at the bottom, and not deeper than eighteen (18) inches. This ditch should extend continuously along the entire levee line, and is intended to gather the seepage water coming through the levee and its base.

Second. On the opposite side of the road, which is the side furthest from the levee, another ditch should be dug, about three and a half (3½) feet wide at top, one (1) foot wide at the bottom, and not less than two and a half (2½) feet deep.

Third. At intervals not exceeding five hundred feet apart, and selected in the lowest depressions of the ground, a transversal ditch should be cut, connecting the near or base ditch, with the far or road ditch, so that the water from the base ditch might be carried into the far and deeper road ditch. These cross ditches should be not less than three (3) feet wide at the bottom, with slopes of one-half (½) horizontal to one (1) vertical; and should be covered with bridges so as to allow traffic over them.

Fourth. At suitable points and wherever the topography of the country develops a low place, the far road ditch must be drained back through the fields into the general plantation or land drains.

The object of the first ditch is to collect the seepage water from the base of the levee, and carry it through the transveral ditch into the far road ditch. The object of the deeper road ditch is to drain the general sub-soil and to pour this sub-soil seepage into the plantation ditches and drains to be carried by them away from the levee.

The base or near ditch should not be dug nearer than the three (3) feet mentioned; nor deeper than the eighteen (18) inches mentioned, as it would weaken the levee should it exceed these dimensions.

Should this work be done thoroughly and continuously, the levees will be able to stand the highest water against them without developing any soft places, and without any sloughing of the levee, which is one of the most dangerous features to combat in high water.

In the accompanying diagram, the ditch "A" outlines the nearer base ditch, the ditch "B' indicates the far or road ditch, and the ditch "C" outlines the transversal connecting ditches to be covered by bridges, while the ditch "D" outlines the plantation drain.

Very respectfully submitted,

ARSENE PERRILLIAT,
*Assistant State Engineer.*

---

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., March 25, 1903.

*Hon. A. H. Gay, Prest. Atchafalaya Basin Levee District, Plaquemine, La.*

MY DEAR MR. GAY: I returned last night from a trip on Bayou Lafourche. I went to the Howell Crevasse, and, day before yesterday, it seemed to be about 240 feet wide. The water from this crevasse seems to flow westward, injuring the Howell and Lagarde plantations and a few small plantations on a back brusle, and then loses itself in the swamp. It will probably put some back water on the Bayou Black plantations in the Parish of Terrebonne.

The crevasse was in the levee immediately in front of Mr. W. E. Howell's house, and was in a piece of levee which had not been enlarged when we did the work in 1899, owing to Mr. Howell's positive refusal to allow any work to be done there. He threatened to enjoin the Board if it attempted to work on this levee, and, after consultation with Col. Sparks, it was decided to leave that small stretch rather than involve the Board in a law-suit, and to spend that money on other places on Bayou Lafourche which were equally in need of work.

From there I came up the bayou, going over the entire levee line to Donaldsonville. I found a very low piece of levee in front of Mr. Munson's place, and some low levees amounting to about three miles in length from Klotzville up. I have urged Mr. Dugas to immediately begin raising these levees. I consider it of the utmost importance that the work of raising these levees be begun at once, as if it is delayed the water will probably catch us before these levees are raised. The people in the neighborhood seem to be apathetic and disinclined to do any work on their levees until it is necessary. I believe that the water at those points and at Donaldsonville will be one foot higher than the high water of 1897, and I consider it of the utmost importance that the levees which I have mentioned above, viz: the Munson levee, and the low levees above Klotzville should be raised at once in order to avoid disaster. I have told this to Mr. Dugas and am going to write it to him today.

I shall again be on the bayou to-morrow or day after, and will go over these stretches of levee, and will do everything in my power to arouse the people to the necessity of the situation at those points.

I hear that on our river line everything is in good condition. As far as I can see, I still retain the same opinion which I had with regard to the height of the water—that we will have somewhat higher water than in 1897. From present outlook I think we should prepare for a foot more water than we had in 1897. With care and vigilance, I see no reason why we should not stand this water on all our line, with the exception of Bayou Lafourche. I shall go on the bayou in the next day or two, and then come up on the river.

With regards, I am,

Very truly yours,

Arsene Perrilliat,

*Asistant State Engineer.*

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., May 19th, 1902.

*To the Honorable Board of Commissioners, for the Pontchartrain Levee District.*

GENTLEMEN: The Board of State Engineers has prepared, for your information, a detailed statement in regard to the present cvondition of the levees throughout your district, and the probable requirements in cubic yards of earth to place said levee line to a grade 4.6 feet above high water of 1897, at Baton Rouge, and 3.3 feet, at Parish line of Jefferson and Orleans, with crown 8 feet and slopes 3 and 3 on 1; and to build new levees where necessary through caving of river bank, or to replace existing old levees too near river bank to be enlarged.

### EAST BATON ROUGE PARISH.

| Name of Levee. | Sta. to Sta. | Length in feet. | Above H. W. 1897. | Cubic Yds. | Remarks. |
|---|---|---|---|---|---|
| | 0- 152 | 15,200 | 3.5 | 55,000 | Levees about one foot below grade. This stretch requires cleaning and grubbing of small trees, bushes, etc. |
| Arlington ..... | 152- 202 | 5,315 | | 233,000 | New levee to be built by State. |
| Arlington to Martinez ..... | 202- 362 | 16,200 | 3.5 | 60,000 | Levees about one foot below grade. |
| Martinez to Chatsworth .. | 362- 590 | 22,800 | 4.0 | 65,000 | Levees about ½ foot below grade. Stretch from Conrad Point to upper line of Chatsworth requires cleaning, and grubbing of bushes, small trees, etc. |
| Chatsworth .... | 590- 691 | 10,100 | 3.5 | 35,000 | Levees about one foot below grade. |
| | 691- 737 | 4,600 | 4.6 | | From Burtville to lower line of parish, levees are up to grade, but require cleaning and resodding in spots. All ponds should be drained. |
| Totals ................. | | 74,215 | | 448,000 | |

### IBERVILLE PARISH.

| Name of Levee. | Sta. to Sta. | Length in feet. | Above H. W. 1897. | Cubic Yds. | Remarks. |
|---|---|---|---|---|---|
| Woodstock to Towles ...... | 737- 942 | 20,500 | 4.4 | | Levees are up to grade, but require cleaning and resodding in spots. |
| Towles to Billings ..... | 942- 976 | 3,400 | 2.2 | 17,000 | Pond should be drained. |

| Name of Levee. | Sta. to Sta. | Length in feet. | Above H. W. 1897. | Cubic Yds. | Remarks. |
|---|---|---|---|---|---|
| Billings to Dupuy ...... | 976-1107 | 13,100 | 3.3 | 50,000 | Levees about one foot below grade. |
| Dupuy to Grandada ... | 1107-1277 | 17,000 | 4.2 | | |
| Jolisaint, N. L. | 1277-1305 | 3,000 | 2.0 | 90,000 | New levee will be required at some future date. |
| Magnolia to Golden Gate . | 1305-1364 | 5,900 | 4.2 | | |
| Golden Gate to Oakley ...... | 1364-1448 | 8,400 | 3.2 | 35,000 | |
| Oakley to Margaret .... | 1448-1507 | 5,900 | 2.2 | 45,000 | |
| Margaret ...... | 1507-1534 | 2,700 | 3.2 | 12,000 | |
| Margaret to Edna ....... | 1534-1581 | 4,700 | 2.4 | 20,000 | |
| Edna to Thiery. | 1581-1623 | 4,200 | 1.5 | 35,000 | |
| Thiery to Ophelia ..... | 1623-1665 | 4,200 | 4.1 | | Levees require cleaning. |
| Ophelia to Lorio. | 1665-1738 | 7,300 | 1.5 | 45,000 | Levees require cleaning. |
| Lorio ......... | 1738-1748 | 1,000 | 4.1 | | |
| Lorio to Point Clear.. | 1748-1764 | 1,600 | 1.5 | 13,000 | Levees require cleaning. |
| Point Clear to Arizona ..... | 1764-2043 | 27,900 | 4.0 | | |
| Arizona to Parish Line.. | 2043-2145 | 10,200 | 2.0 | 85,000 | Levees require cleaning. |
| Totals .............. | | 141,000 | | 447,000 | |

## ASCENSION PARISH.

| Name of Levee. | Sta. to Sta. | Length in feet. | Above H. W. 1897. | Cubic Yds. | Remarks. |
|---|---|---|---|---|---|
| Southwood to Willow Grove. | 2145-2492 | 34,700 | 2.0 | 250,000 | Levees require cleaning. |
| Willow Grove.. | 2492-2510 | 1,800 | 3.0 | 10,000 | |
| Gem to Canty's. | 2510-2617 | 10,700 | 1.5 | 90,000 | Levees require cleaning and grubbing of small trees, bushes, etc. |
| Canty to LeBlanc ..... | 2617-2685 | 6,800 | 1.0 | 50,000 | Levees require cleaning and grubbing of small trees, bushes, etc. |
| Leblanc to Darrowville . | 2685-2755 | 7,000 | 2.0 | 50,000 | |
| Darrowville to Hermitage ... | 2755-2772 | 1,700 | 1.0 | 15,000 | |
| Hermitage, N. L. | 2772-2819 | 4,603 | 0.5 | 125,000 | Caving bank; new levee will be required. |
| Hermitage ..... | 2819-2850 | 3,100 | 0.5 | 25,000 | |
| Hermitage to Riverton .... | 2850-2953 | 10,300 | 2.0 | 50,000 | |
| Riverton ...... | 2953-3012 | 5,900 | 4.1 | | |
| Houmas Res. to Store ....... | 3012-3042 | 3,000 | 2.0 | 15,000 | |
| Houmas Store to Parish Line.. | 3042-3140 | 9,800 | 4.0 | | |
| Totals .............. | | 99,403 | | 680,000 | |

## ST. JAMES PARISH.

| Name of Levee. | Sta. to Sta. | Length in feet. | Above H. W. 1897. | Cubic Yds. | Remarks. |
|---|---|---|---|---|---|
| Parish Line to St. Mary Chapel | 3140-3266 | 12,600 | 2.0 | 75,000 | |
| St. Mary Chapel | 3266-3290 | 2,400 | | | Under contract by U. S. |
| to Alta Villa | 3290-3341 | 5,100 | | | Advertised by U. S. |
| Alta Villa to St. Rose | 3341-3448 | 10,700 | 1.0 | 100,000 | |
| St. Rose, N. L. | 3448-3474 | 2,400 | 1.0 | 75,000 | Levee too near to be enlarged. |
| Nita | 3474-3519 | 4,500 | 2.0 | 30,000 | |
| Celestine, N. L. | 3519-3544 | 2,400 | 1.5 | 75,000 | Caving bank; new levee will be required at some future date. |
| Lilly | 3544-3578 | 3,400 | 2.5 | 19,000 | |
| Uncle Sam to St. Michael Ch. | 3578-3685 | 10,700 | 1.5 | 90,000 | |
| St. Michael Church to Cent. Store | 3685-3716 | 3,300 | 1.5 | 76,000 | New levee too near river bank to be enlarged. |
| Cent. Store to Oneida Store | 3716-3890 | 17,400 | 2.0 | 145,000 | |
| Oneida, N. L. | 3890-3915 | 2,600 | 2.0 | 75,000 | Levee too near river bank to be enlarged. |
| Belmont to S. Elmo | 3915-4040 | 12,500 | 1.5 | 150,000 | |
| St. Elmo | 4040-4110 | 7,000 | 2.0 | 35,000 | |
| Bellevue to Parish Line | 4110-4358 | 24,800 | 1.5 | 150,000 | |
| Totals | | 121,800 | | 1,095.000 | |

## ST. JOHN PARISH.

| Name of Levee. | Sta. to Sta. | Length in feet. | Above H. W. 1897. | Cubic Yds. | Remarks. |
|---|---|---|---|---|---|
| Parish Line to Angelina | 4358-4416 | 5,800 | 2.5 | 45,000 | |
| Angelina | 4416-4443 | 2,700 | 0.5 | 30,000 | |
| New Hope, N. L. | 4443-4489 | 5,000 | 1.5 | 190,000 | Caving bank; new levee will be required. |
| Hope | 4489-4531 | 4,200 | 1.5 | 25,000 | |
| Hope to Terrehaute | 4531-4610 | 7,900 | 2.0 | 32,000 | |
| Terrehaute to Cornland | 4610-4740 | 13,000 | 1.0 | 65,000 | |
| Cornland | 4740-4766 | 2,600 | 2.0 | 13,000 | |
| Cornland to Belle Point | 4766-4841 | 7,500 | 1.5 | 35,000 | |
| Belle Point to Louque | 4841-5005 | 16,400 | 1.5 | 92,000 | |
| Louque | 5005-5027 | 2,000 | 2.0 | 70,000 | Probable new levee. |
| Bonnet Carre to Parish Line | 5027-5142 | 11,500 | 3.0 | 50,000 | |
| Totals | | 78,600 | | 647,000 | |

## ST. CHARLES PARISH.

| Name of Levee. | Sta. to Sta. | Length in feet. | Above H. W. 1897. | Cubic Yds. | Remarks. |
|---|---|---|---|---|---|
| Anchor ........ | 5142-5205 | 6,300 | 1.5 | 40,000 | |
| Gypsy to Diamond .... | 5205-5363 | 15,800 | 2.0 | 482,000 | |
| Diamond ...... | 5363-5396 | 3,500 | 2.0 | 90,000 | Probable new levee. |
| Diamond to Good Hope... | 5396-5434 | 3,800 | 1.0 | 37,000 | |
| Prospect ...... | 5434-5517 | 8,300 | 2.0 | 35,000 | |
| Sarpy ......... | 5517-5545 | 2,800 | 1.5 | 30,000 | |
| Victoria ....... | 5545-5601 | 5,600 | 2.0 | 45,000 | |
| Red Church .... | 5601-5664 | 6,300 | 2.0 | 22,000 | |
| Destrehan ..... | 5664-5734 | 7,000 | 1.5 | 32,000 | |
| Modoc-Elkinsville ... | 5734-5840 | 10,600 | 3.7 | | |
| St. Rose ....... | 5840-5913 | 7,300 | 1.0 | 40,000 | |
| Almedia ....... | 5913-5959 | 4,600 | 2.0 | 20,000 | |
| Upper Fairview. | 5959-5980 | 3,100 | 3.7 | | |
| Fairview, N. L.. | 5980-5992 | 1,500 | | 50,000 | Probable new levee. |
| Lower Fairview. | 5992-6024 | 3,200 | 2.0 | 20,000 | |
| Totals ................ | | 89,700 | | 943,000 | |

## JEFFERSON PARISH.

| | | | | | |
|---|---|---|---|---|---|
| Parish Line to Hanson City. | 6024-6062 | 3,800 | 1.5 | 15,000 | |
| Hanson City.... | 6062-6077 | 1,500 | 3.5 | | |
| Hanson City to Trudeau .. | 6077-6186 | 10,900 | 1.5 | 50,000 | |
| Sauve ......... | 6186-6237 | 5,100 | 3.5 | | |
| Sauve to Boisblanc ... | 6237-6271 | 4,000 | 1.5 | 160,000 | Probable new levee. |
| Boisblanc ...... | 6271-6291 | 2,000 | 1.5 | 12,000 | |
| Perkins ....... | 6291-6321 | 3,100 | 2.0 | 60,000 | Probable new levee. |
| Tchoupitoulas .. | 6321-6384 | 6,300 | 1.5 | 30,000 | |
| Soniat Lower... | 6384-6394 | 1,000 | 3.4 | | |
| So. University.. | 6394-6419 | 2,500 | 1.0 | 12,000 | |
| Lafreniere ..... | 6419-6437 | 1,800 | 3.3 | | |
| Elmwood ...... | 6437-6519 | 8,200 | 1.5 | 35,000 | |
| White Hall to Southport .... | 6519-6560 | 4,100 | 3.3 | | |
| Southport Bend. | 6560-6608 | 4,800 | 3.3 | 108,000 | Probable new levee in the bend. |
| Totals ............... | | 59,100 | | 482,000 | |

## RECAPITULATION.

### RECAPITULATION BY PARISHES, SHOWING HEIGHT OF LEVEES ABOVE H. W. OF 1897.

Lengths of stretches given in linear feet.

| Parish. | Height above High Water 1897. | | | | Total length of Levee Line in Parish. |
|---|---|---|---|---|---|
| | 0 to 1 feet above. | 1 to 2 feet above. | 2 to 3 feet above. | 3 feet above to grade. | |
| East Baton Rouge—<br>0 to 737........ | | | | 74,215 | 74,215 |
| Iberville Parish—<br>737 to 2145..... | | 13,100 | 27,200 | 100,700 | 141,000 |
| Ascension—<br>2145 to 3140.... | 16,203 | 65,700 | 1,800 | 15,700 | 99,403 |
| St. James—<br>3140 to 4358.... | 13,100 | 97,800 | 3,400 | 7,500 | 121,800 |
| St. John Parish—<br>4358 to 5142.... | 15,700 | 45,600 | 17,300 | | 78,600 |
| St. Charles—<br>5142 o 6024..... | 12,600 | 63,400 | | 13,700 | 89,700 |
| Jefferson—<br>6024 to 6608.... | 7,300 | 38,300 | | 13,500 | 59,100 |
| Totals ....... | 64,903 | 323,900 | 49,700 | 225,315 | 663,818* |

*Total levee line in District.

### RECAPITULATION BY PARISHES, OF CUBIC YARDS REQUIRED TO PLACE LEVEE LINE ABOVE DESCRIBED GRADE.

| Parish. | Cu. yds. of raising and enlargement. | Cu. yds. of new levees. | Total cubic yards required. |
|---|---|---|---|
| East Baton Rouge.... | 215,000 | 233,000 | 448,000 |
| Iberville ............ | 357,000 | 90,000 | 447,000 |
| Ascension ........... | 555,000 | 125,000 | 680,000 |
| St. James ........... | 794,000 | 301,000 | 1,095,000 |
| St. John ............ | 387,000 | 260,000 | 647,000 |
| St. Charles .......... | 803,000 | 140,000 | 943,000 |
| Jefferson ........... | 154,000 | 328,000 | 482,000 |
| Totals .......... | 3,265,000 | 1,477,000 | 4,742,000* |

*Total required in District.

The State has undertaken the construction of a new levee at Arlington in the Parish of East Baton Rouge, made necessary, as you are aware, by a recent cave of river bank and existing levee, amounting to 233,000 cubic yards at 18½ cents per cubic yard, at a cost of nearly $44,000, which is more than double the annual amount usually expended by the State in the Pontchartrain Levee District, and was only made possible by the increase of the funds ordinarily available for levee work, derived from sale of State swamp lands, and it should, therefore, be understood that the district cannot reasonably expect further aid from the funds administered by the State, either this season or the next.

As to what levee work is to be undertaken by the United States Government during the coming season, we are not prepared to state at this time, as the pending House Bill No. 12,346, for the improvement of Rivers and Harbors has not become a law.

Whilst we are aware that it is beyond the means of the district to undertake any large amount of levee work to full grade and section as prescribed by the Mississippi River Commission, yet there are several levees that will have to be re-built at some future date, on account of the caving of river banks, and we would advise, if you can find the available means to do so, the construction of a new levee at Hermitage, Ascension Parish, and New Hope, St. John Parish, and the raising and enlargement of the Darrowville and Hermitage levees in Ascension Parish, and the Angelina Levee in St. John Parish, which levees were nearly overtopped by the high water of 1897. These stretches have been surveyed and we have estimated that the quantity of earthwork required to build same to a grade of two feet above the high water of 1897 with crown 8 feet and slopes 3 and 3 on 1 to be as follows:

| Name of Levee—Parish. | Length in feet. | Average height. | Above H. W. 1897. | Cubic Yards. |
|---|---|---|---|---|
| Hermitage—Ascension | 4,603 | 12. | 2.0 | 92,000 |
| New Hope—St. John | 2,442 | 16.6 | 2.0 | 88,000 |
| Darrowville and Hermitage—Ascension | 5,265 | | 2.0 | 18,000 |
| Angelina—St. John | 2,629 | | 2.0 | 16,000 |
| Totals | 14,939 | | | 214,000 |

Very respectfully,
*The Board of State Engineers,*
*Per* Sidney F. Lewis,
*Assistant State Engineer.*

---

STATE OF LOUISIANA,
Office Board of State Engineers,
New Orleans, La., June 16th, 1903.

*To the Honorable President and Members of the Board of Commissioners of the Pontchartrain Levee District.*

Gentlemen: We have prepared in detail a tabulated statement showing the present condition of the one hundred and twenty-six miles of levee on the east bank of the Mississippi River extending from the lower limits of Baton Rouge, the upper end of the district, to the lower line of Jefferson Parish, the lower line of the district.

The height of the recent flood against your levees, from the official records, as compared with the flood of 1897, was as follows, viz:

At Baton Rouge, the highest gauge reading was six-tenths (.6) below high water of 1897; opposite Donaldsonville, the highest gauge reading was six-tenths (.6) below high water of 1897. At College Point, the highest gauge reading was two-tenths (.2) below high water of 1897. At the lower line of Jefferson Parish, the highest gauge reading was two-tenths (.2) above high water of 1897.

In anticipation of a greater flood all along the line, over twenty-one miles of levee less than one foot above the high water mark of 1897 were raised, of which one-half mile would have been overtopped by the water of the recent flood. During the flood which lasted over eight weeks many weak places were developed in the levees from holes made by crayfish and muskrats and other destructive agents, also sloughing of the land slope through defective drainage. Certain stretches of levee from their exposed position had to be protected from wave-wash, but there was no disaster, which, in a measure, was greatly due to the untiring care, and systematic efforts of the President and members of your Board, assisted by the planters, railroad authorities and parties at interest behind these embankments.

Respectfully submitted,

Sidney F. Lewis,
*Assistant State Engineer.*

Statement showing approximate quantity of earthwork required to place the levee line of the Pontchartrain Levee District to a grade 3 feet above the high water of 1897; or to Mississippi River Commission grade (*i. e.* 4.6 above high water of 1897 at Baton Rouge and 3.3 at lower line of Jefferson Parish) and to build new levees where required to said grades, with crown 8 feet and side slopes 3 and 3 to 1.

| NAME OF LEVEE | Station to Station | Length in Feet | Above H. W. 1897 | Cu. Yds. for Englt. to a 3' Grade | Cu. Yds. for Enlgt. to M. R. C. Grade | Cu. Yds. for New Levee to 3' Grade | Cu. Yds. for New Levee to M. R. C. Grade | REMARKS |
|---|---|---|---|---|---|---|---|---|
| | EAST BATON ROUGE PARISH. | | | | | | | |
| Magnolia Mound to Arlington | 0- 151 | 15,100 | 3.5 | ......... | 50,000 | ......... | ......... | |
| Laurel to Conrad | 241- 325 | 8,400 | 3.5 | ......... | 28,000 | ......... | ......... | |
| Martinez | 383- 430 | 4,700 | 3.5 | ......... | 16,000 | ......... | ......... | |
| Gay Estate | 430- 515 | 8,500 | 3.5 | ......... | 30,000 | ......... | ......... | |
| Ben Hur | 515- 590 | 7,500 | 3.5 | ......... | 25,000 | ......... | ......... | |
| Ben Hur to Burtville | 590- 691 | 10,100 | 3.5 | ......... | 31,000 | ......... | ......... | |
| | | 54,300 | | | 180,000 | | | |
| | IBERVILLE PARISH. | | | | | | | |
| Benken | 942- 976 | 3,400 | 1.0 | 19,000 | 35,000 | 72,000 | 100,000 | Levee to near river bank to be enlarged |
| Billings | 976-1022 | 4,600 | 3.0 | ......... | 24,000 | ......... | ......... | |
| Gomez | 1078-1106 | 2,800 | 2.0 | 7,500 | 20,000 | ......... | ......... | |
| Jolisaint | 1277-1305 | 2,800 | 2.0 | 8,000 | 17,000 | ......... | ......... | |
| Golden Gate to Oakley | 1364-1447 | 8,300 | 3.0 | ......... | 25,000 | ......... | ......... | |
| Oakley to Evergreen | 1447-1508 | 6,100 | 2.0 | 20,000 | 42,000 | ......... | ......... | |
| Margaret | 1508-1534 | 2,600 | 2.0 | 10,000 | 20,000 | ......... | ......... | |
| Bagatelle | 1534-1557 | 2,300 | 2.0 | 7,600 | 24,000 | ......... | ......... | Levee too near river bank to be enlarged for a distance of 4,000 feet. |
| Ophelia to Lorio | 1687-1738 | 5,100 | 1.0 | 27,000 | 56,000 | 78,000 | 90,000 | |
| Welcome | 1748-1764 | 1,600 | 1.0 | 9,500 | 21,000 | ......... | ......... | |
| Arizona to Parish Line | 2043-2145 | 10,200 | 2.0 | 35,000 | 70,000 | ......... | ......... | |
| | | 49,800 | | 143,600 | 354,000 | 150,000 | 190,000 | |

## ASCENSION PARISH.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Parish Line to Cottage Farm | 2145-2330 | 18,500 | 2.0 | 57,000 | 118,000 | ......... | ......... | |
| Linwood to Belle Helene | 2330-2448 | 12,800 | 3.0 | ......... | 45,000 | ......... | ......... | |
| Landry | 2458-2493 | 3,500 | 2.0 | 10,000 | 23,000 | ......... | ......... | |
| Willow Grove | 2493-2509 | 1,600 | 3.0 | ......... | 5,300 | ......... | ......... | |
| Gem | 2509-2520 | 1,100 | 2.0 | 3,500 | 7,500 | ......... | ......... | |
| Le Blanc | 2685-2700 | 1,500 | 2.0 | 4,200 | 9,000 | ......... | ......... | |
| Von Hoff | 2700-2711 | 1,100 | 1.0 | 5,700 | 8,700 | ......... | ......... | |
| Jamison | 2711-2754 | 4,300 | 2.0 | 12,000 | 24,000 | ......... | ......... | |
| Darrowville | 2754-2777 | 2,300 | 2.0 | 7,000 | 15,000 | ......... | ......... | |
| Hermitage | 2777-2815 | 3,800 | 2.0 | 14,000 | 28,000 | ......... | ......... | |
| Hermitage | 2815-2919 | 10,400 | 2.0 | 28,000 | 57,000 | ......... | ......... | |
| Bocage | 2919-2953 | 3,400 | 1.5 | 15,000 | 26,000 | ......... | ......... | |
| Miles Residence to Store | 3020-3041 | 2,100 | 2.0 | 6,500 | 13,500 | ......... | ......... | |
| | | 66,400 | | 162,900 | 380,000 | ......... | ......... | |

## ST. JAMES PARISH.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Parish Line to Bagatelle | 3141-3176 | 3,500 | 1.5 | 15,000 | 25,000 | ......... | ......... | Levee too near river bank to be enlarged, new levee will be required |
| Bagatelle | 3176-3184 | 800 | ...... | ......... | ......... | 15,000 | 20,000 | |
| St. Mary's Chapel Settle | 3184-3238 | 5,400 | 1.5 | 20,000 | 34,000 | ......... | ......... | Levee too near river bank to be enlarged, new levee will be required. |
| St. Rose to Nita | 3448-3478 | 3,000 | 1.0 | ......... | ......... | 85,000 | 110,000 | |
| Nita | 3478-3522 | 4,400 | 1.5 | 20,000 | 34,000 | ......... | ......... | |
| Celestine | 3522-3544 | 2,200 | 1.0 | ......... | ......... | 65,000 | 75,000 | Caving bank new levee will be required |
| Lillie to Uncle Sam | 3544-3577 | 3,300 | 1.5 | 16,000 | 27,000 | ......... | ......... | |
| College Point | 3762-3800 | 3,800 | 2.0 | 9,100 | 20,000 | ......... | ......... | |
| Oneida (upper) | 3800-3890 | 9,000 | 1.0 | 49,000 | 77,000 | ......... | ......... | |
| Oneida (lower) | 3890-3909 | 1,900 | 1.5 | 9,000 | 15,000 | ......... | ......... | |
| Belmont | 3909-3948 | 3,900 | 1.0 | 28,000 | 44,000 | ......... | ......... | |
| St. Elmo | 4045-4082 | 3,700 | 2.0 | 11,000 | 24,000 | ......... | ......... | |
| Longue Vue | 4082-4110 | 2,800 | 1.0 | 15,000 | 24,000 | ......... | ......... | |
| Lutcher | 4215-4262 | 4,700 | 1.5 | 22,000 | 38,000 | ......... | ......... | |
| | | 52,400 | | 214,100 | 362,000 | 165,000 | 205,000 | |

| NAME OF LEVEE | Station to Station | Length in Feet | Above H. W. 1897 | Cu. Yds. for Enlgt. to a 3' Grade | Cu. Yds. for Enlgt. to M.R.C. Grade | Cu. Yds. for New Levee to 3' Grade | Cu. Yds. for New Levee to M.R.C. Grade | REMARKS |
|---|---|---|---|---|---|---|---|---|
| | ST. JOHN PARISH. | | | | | | | |
| New Hope | 4442-4467 | 2,500 | 2.0 | 8,200 | 17,000 | | | |
| Hope (New Levee) | 4467-4489 | 2,200 | | | | 80,000 | 90,000 | Caving bank new levee will be required. |
| Hope | 4467-4556 | 8,900 | 1.5 | 35,000 | 61,000 | | | |
| Glencoe to Reserve | 4456-4694 | 23,800 | 1.0 | 120,000 | 188,000 | | | |
| Reserve | 4694-4738 | 4,400 | 1.0 | 24,000 | 38,000 | | | |
| Reserve-Belle Point | 4738-4834 | 9,600 | 1.0 | 50,000 | 76,000 | | | |
| Belle Point to Laplace | 4834-4910 | 7,600 | 1.5 | 30,000 | 50,000 | | | Levee too near river bank to be enlarged, new levee will be required. |
| Louque | 5005-5027 | 2,200 | | | | 55,000 | 70,000 | |
| Bonnet Carre-Anchor | 5009-5142 | 13,300 | 3.0 | | 75,000 | | | |
| | | 74,500 | | 267,200 | 505,000 | 135,000 | 160,000 | |

## ST. CHARLES PARISH.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Anchor-Gypsy | 5142-5201 | 5,900 | 1.0 | 43,000 | 65,000 | ......... | ......... | |
| Gypsy-Hermitage | 5201-5280 | 7,900 | 1.0 | 42,000 | 55,000 | ......... | ......... | |
| Hermitage | 5280-5345 | 6,500 | 1.0 | 38,000 | 50,000 | ......... | ......... | |
| Roseland | 5345-5363 | 1,800 | 0.5 | 12,000 | 13,500 | ......... | ......... | |
| Diamond | 5363-5395 | 3,200 | 1.5 | ......... | ......... | 82,000 | 90,000 | Settling bank; new levee might be required. |
| Good Hope-Prospect | 5395-5517 | 12,200 | 1.0 | 72,000 | 92,000 | ......... | ......... | |
| Sarpy Crevasse | 5517-5545 | 2,800 | ...... | 30,000 | 37,000 | ......... | ......... | |
| Victoria to Ormond | 5545-5609 | 6,400 | 1.5 | 32,000 | 45,000 | ......... | ......... | |
| Red Church | 5609-5665 | 5,600 | 1.0 | 28,000 | 34,000 | ......... | ......... | |
| Destrehan | 5665-5734 | 6,900 | 1.0 | 35,000 | 41,000 | ......... | ......... | |
| Modoc and Pecan Grove | 5734-5795 | 6,100 | 2.5 | 10,000 | 16,000 | ......... | ......... | |
| Pecan Grove Lower | 5795-5830 | 3'500 | 1.5 | 12,000 | 16,500 | ......... | ......... | |
| St. Rose and Almedia | 5830-5959 | 12,900 | 1.0 | 64,000 | 73,000 | ......... | ......... | |
| Upper Fairview | 5959-6002 | 4,300 | 2.0 | 10,000 | 19,000 | ......... | ......... | |
| Lower Fairview | 6002-6024 | 2,200 | 1.5 | 10,000 | 16,000 | ......... | ......... | |
| | | 88,200 | | 438,000 | 573,000 | 82,000 | 90,00 | |

| NAME OF LEVEE | Station to Station | Length in Feet | Above H. W. 1897 | Cu. Yds. for Enlgt. to a 3' Grade | Cu. Yds. for Enlgt. to M.R.C. Grade | Cu. Yds. for New Levee to 3' Grade | Cu. Yds. for New Levee to M.R.C Grade | REMARKS |
|---|---|---|---|---|---|---|---|---|
| JEFFERSON PARISH. | | | | | | | | |
| Butler-Kenner ............ | 6021-6030 | 900 | ...... | ......... | ......... | ......... | 23,000 | Levee too near river bank to be enlarged; new levee will be required. |
| Parish Line to Hanson City | 6024-6062 | 3,800 | 0.5 | 25,000 | 30,000 | ......... | ......... | |
| Upper Kennerville ........ | 6077-6105 | 2,800 | 1.0 | 15,000 | 20,000 | ......... | ......... | |
| Kennerville .............. | 6105-6156 | 5,100 | 0.5 | ......... | 33,000 | ......... | ......... | |
| Trudeau .................. | 6156-6189 | 3,300 | 0.5 | ......... | 25,000 | ......... | ......... | |
| Sauve .................... | 6189-6237 | 4,800 | 1.0 | ......... | 35,000 | ......... | ......... | Caving bank in front of Weckerling Farm; new levee will be required. |
| Sauve-Boisblanc .......... | 6237-6271 | 4,000 | ...... | ......... | ......... | ......... | 160,000 | |
| Boisblanc ................ | 6271-6291 | 2,000 | 1.0 | ......... | 10,000 | ......... | ......... | |
| Perkins .................. | 6291-6321 | 3,100 | ...... | ......... | ......... | ......... | 60,000 | Levee too near river bank to be enlarged; new levee will be required |
| Tchoupitoulas ............ | 6321-6383 | 6,200 | 1.0 | ......... | 32,000 | ......... | ......... | |
| Lower Tchoupitoulas ...... | 6383-6393 | 1,000 | 2.0 | ......... | 3,000 | ......... | ......... | |
| Southern University ...... | 6393-6419 | 2,600 | 1.0 | ......... | 13,000 | ......... | ......... | |
| Lafreniere-Elmwood ....... | 6419-6483 | 6,400 | 1.5 | ......... | 23,000 | ......... | ......... | |
| Labarre .................. | 6483-6527 | 4,400 | 2.0 | ......... | 10,000 | ......... | ......... | Caving bank; probable new levee will be required. |
| Skidmore ................. | 6575-6584 | 900 | ...... | ......... | ......... | ......... | 40,000 | |
| Southport ................ | 6593-6608 | 1,500 | ...... | ......... | ......... | ......... | 55,000 | Caving bank; probable new levee. |
| | | 52,800 | | 40,000 | 234,000 | ......... | 338,000 | |

## RECAPITULATION

| PARISH | ENLARGEMENT | | NEW LEVEES | |
|---|---|---|---|---|
| | Cu. Yds. for 3' Grade | Cu. Yds. for M. R. C. Grade | Cu. Yds. for 3' Grads | Cu. Yds. for M. R. C. Grade |
| E. Baton Rouge.... | ............ | 180,000 | ............ | ............ |
| Iberville............ | 143,600 | 354,000 | 150,000 | 190,000 |
| Ascension .......... | 162,900 | 380,000 | ............ | ............ |
| St. James........... | 214,100 | 362,000 | 165,000 | 205,000 |
| St. John...... ..... | 267,200 | 505,000 | 135,000 | 160,000 |
| St. Charles......... | 438,000 | 573,000 | 82,000 | 90,000 |
| Jefferson ........... | 40,000 | 234,000 | ............ | 338,000 |
| | 1,265,800 | 2,588,000 | 532,000 | 983,000 |

---

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., June 1st, 1903.

*To the Honorable President and Members of the Board of Commissioners of the Lafourche Basin Levee District.*

GENTLEMEN: In view of the fact that owing to the rapid decline in the river it will be practicable to resume work on the levees throughout your district at a much earlier period than in previous years; we have prepared in detail a statement showing the present condition of the one hundred and twenty miles of levee on the Mississippi River extending from Donaldsonville, at the head of Bayou Lafourche, the upper end of the district, to the lower end of Riceland plantation, in Plaquemines Parish, the lower limits of the district.

The height of the recent flood against your levee line on the river, from the official records, as compared with the flood of 1897, was as follows, viz:

At Donaldsonville, the highest gauge reading was six-tenths (.6) below high water of 1897.

At Cabanocey, eighteen miles below Donaldsonville, the highest gauge reading was two-tenths (.2) below high water of 1897.

At Nine Mile Point, the highest gauge reading was two-tenths (.2) above high water of 1897.

At Gouldsboro, the highest gauge reading was eight-tenths (.8) above high water of 1897.

At Riceland, the highest gauge reading was over one foot above high water of 1897.

The high water of 1903 was reached in the lower end of your district in the beginning of March, and its culminating point about the 21st of March, whilst at Donaldsonville it reached its highest from April 4-10, inclusively.

The levees in Plaquemines Parish were not only subjected to a greater and longer strain from a higher flood in the river than ever known before, but were considerably endangered from wave-wash caused by the prevailing winds at this time of the year, and the passing of large ocean steamers—notably was the case at the upper end of Myrtle Grove plantation where the levee for a mile was almost breached in several places by the waves caused by high winds on February 25th and 26th.

We believe it would be well, and we have so estimated in the tabular statement, to increase the grade of future work in Plaquemines Parish to three feet above high water of 1903, instead of the present Mississippi River Commission grade.

On March 26th, late at night, a hole broke out at the base of the Hymelia Levee, below the upper line of the Parish of St. Charles, and before anything could be done to stop it, the crown of the levee fell in, and the levee was crevassed. By the persistent and worthy efforts of your Board, assisted by the planters and the railroad authorities, made in its enclosure, its discharge never appreciably affected the flood stage, which had practically culminated at the time the break occurred, and in consequence the damage from overflow was very much restricted.

On April 5th, when the river was at its highest stage, and near the top of the levee, the caving of the bank breached the levee near the upper line of Magnolia Plantation, in the Paris hof Plaquemines. The cave took in a part of the land side base for a length of two hundred and thirty feet, and the water at once ran over the remaining part of the levee some two feet deep, and later five or six feet deep. By prompt action the planters, your Board and the officials of the New Orleans, Fort Jackson and Grand Isle Railroad succeeded in securely closing the break and prevented any serious damage from overflow.

On Bayou Lafourche, the highest water reached was as follows: viz:

At Donaldsonville, .6 below high water of 1897.
At Napoleonville, .5 below high water of 1897.
At Thibodaux, .9 above high water of 1897.
At Raceland, .8 above high water of 1897.

At Lockport, about .7 above high water of 1897.

At Harang's, about .5 above high water of 1897.

There were no breaks on the east bank of the bayou, whilst there were three on the west bank.

We have not prepared any statement in this report as to future levee work to be undertaken by your Board on Bayou Lafourche, pending the status of the present injunction suit which is now awaiting a verdict from the Supreme Court. I have made a recent inspection of the levees on Bayou Lafourche, so we are prepared at any time, when called upon, to furnish a statement.

There has been no levee work undertaken by the State in your district since 1901. The allotments from the General Engineer Fund since your organization up to 1901 amount to $194,431.15; the expenditures from said Fund amount to $177,891.94; leaving a balance to your credit of $16,539.21.

It is possible, although the fund is not yet available, that you will be allotted for 1903 a sum similar to that which you have been receiving in the past ten years, say, $20,000.

Very respectively,
*The Board of State Engineers,*
*Per* SIDNEY F. LEWIS,
*Assistant State Engineer.*

Statement showing approximate quantities of earthwork required to place the levee line of the Lafourche Basin Levee District to Mississippi River Commission Grade. (*i. e.* 4.4 feet above high water of 1897 at Donaldsonville, and 3.3 feet at lower line of Jefferson Parish, and 3.0 above high water of 1903 in Plaquemines Parish) and build new levees where required with 8 foot crown, with slopes of 3 and 3 to 1.

| NAME OF LEVEE | Station to Station | Length in Feet | Above H. W. 1897 | Cu. Yds. of Enlgt. required for M.R.C.Gr. | Cu. Yds. of New Levees necess'y for M.R.C.Gr. | REMARKS |
|---|---|---|---|---|---|---|
| | | | | ASCENSION PARISH. | | |
| Donaldsonville Front | 0-50 | 5,000 | 3.5 | 14,000 | | |
| Esnault to Simms | 50-70 | 2,000 | 3.0 | 9,000 | | |
| Peytavin | 70-94 | 2,400 | 2.0 | 16,000 | | |
| Landry | 94-108 | 1,400 | | | 45,000 | 1,300 feet of levee too near river bank to be enlarged—probable new levee required. |
| | | 10,800 | | 39,000 | 45,000 | |
| | | | | ST. JAMES PARISH. | | |
| Salsburg | 442-447 | 500 | 1.0 | 5,000 | | From upper end of Salsburg to Brookstown badly wave-washed. |
| Lauderdale | 472-491 | 1,900 | | | 60,000 | Caving bank, probable new levee required. |
| Acadia | 523-539 | 1,600 | | | 42,000 | New levee staked out and notes issued. |
| New Hope | 606-628 | 2,200 | 1.0 | 20,000 | | Enlargament staked out and notes issued. |
| Welcome | 628-660 | 3,200 | | | 65,000 | New levee staked out and notes issued. |
| Jamestown | 660-673 | 1,300 | 2.0 | 8,000 | | Enlargement staked out and notes issued. |
| St. Clair-St. Cecile | 695-806 | 11,100 | 2.0 | 62,000 | | |
| St. James Church | 876-893 | 1,700 | 2.0 | | 45,000 | Levee too near river bank to be raised, new levee required. |
| Pikes Peak | 1040-1082 | 4,200 | 2.5 | 24,000 | | |
| St. Joseph | 1219-1298 | 7,900 | 1.0 | 68,000 | | |
| Armant | 1298-1363 | 6,500 | 2.0 | 36,000 | | |
| Laura | 1363-1400 | 3,700 | 2.0 | 20,000 | | |
| Magnolia | 1400-1471 | 7,100 | 2.5 | 26,000 | | |
| Wauguespach | 1471-1529 | 5,800 | 2.5 | 26,000 | | |
| | | 58,700 | | 295,000 | 212,000 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | **ST. JOHN PARISH.** | | | | | |
| Upper St. John | 1529-1575 | 4,600 | 3.0 | 12,000 | ......... | |
| Poor Devil Store | 1575-1582 | 700 | 2.0 | ......... | 20,000 | Levee too near river bank to be enlarged, new levee required. |
| Poor Devil Store | 1582-1589 | 700 | 2.0 | 4,000 | ......... | |
| Horn Store | 1589-1620 | 3,100 | 2.0 | ......... | 70,000 | Levee too near river bank to br enlarged, new levee required. |
| Willow Grove Store | 1649-1663 | 1,400 | 2.5 | 10,000 | ......... | |
| Whitney to Evergreen | 1707-1721 | 1,400 | 2.5 | 12,000 | ......... | |
| Stevenson to Bonsecour | 1786-1881 | 9,500 | 2.5 | 45,000 | ......... | |
| Columbia | 1935-2010 | 7,500 | 1.0 | 74,000 | 160,000 | Levee too near river bank to be enlarged, probable new levee required. |
| St. John Church | 2010-2063 | 5,300 | 2.0 | 27,000 | ......... | |
| Gold Mine | 2104-2153 | 4,900 | 2.0 | 27,000 | ......... | |
| Bonnet Carre Settlt | 2153-2245 | 9,200 | 2.5 | 33,000 | ......... | |
| Above Parish Line | 2303-2316 | 1,300 | 3.0 | 4,000 | ......... | |
| | | 49,600 | | 248,000 | 250,000 | |
| | **ST. CHARLES PARISH.** | | | | | |
| Hymelia Crevasse | 2316-2328 | 1,200 | | ......... | 70,000 | |
| Hymelia | 2328-2356 | 2,800 | 2.0 | 17,000 | ......... | |
| Kilona to Star | 2471-2554 | 8,300 | 2.0 | 53,000 | ......... | |
| Star | 2554-2592 | 3,800 | 2.0 | ......... | 65,000 | Caving bank new levee required. |
| Star to Pelican | 2592-2630 | 3,800 | 2.0 | 24,000 | ......... | |
| Flagtown to Ashton | 2760-2873 | 11,300 | 2.5 | 60,000 | ......... | |
| Ashton | 2873-2898 | 2,500 | 2.5 | 17,000 | ......... | |
| Luling | 2920-2948 | 2,800 | 2.0 | 22,000 | ......... | |
| Lone Star | 2978-3011 | 3,300 | 2.5 | 15,000 | ......... | |
| Davis | 3032-3065 | 2,800 | 2.5 | 10,000 | ......... | |
| | | 42,600 | | 218,000 | 135,000 | |

| NAME OF LEVEE | Station to Station | Length in Feet | Above H. W. 1903 | Cu. Yds. of Enlgt. required for M. R.C.Gr. | Cu. Yds. of NewLevees necess'y for M. R.C.Gr. | REMARKS |
|---|---|---|---|---|---|---|
| **JEFFERSON PARISH.** | | | | | | |
| | | | Above H. W. 1903 | | | |
| Willswood | 3463-3536 | 7,300 | 2.0 | 30,000 | | |
| Fairfield | 3658-3737 | 7,900 | 1.5 | 50,000 | | |
| Fairfield | 3737-3785 | 4,800 | 2.0 | 26,000 | | |
| Le Breton | 3785-3820 | 3,500 | 1.5 | 20,000 | | |
| Nine-Mile Point | 3820-3926 | 16,000 | 2.0 | 45,000 | | |
| T. & P. R. R. Property | 3926-3956 | 3,000 | 1.0 | 17,000 | | |
| Co. Canal to Four Oaks Plantation | 0-90 | 9,000 | .5 | 78,000 | | Upper end U. S. Barataria Levee District. |
| Southside | 90-125 | 3,500 | 1.0 | 23,000 | | |
| Amesville | 125-171 | 4,600 | 1.5 | 23,000 | | |
| Bell Crevasse to Parish Line | 171-380 | 20,900 | 1.0 | 134,000 | | |
| | | 75,100 | | 446,000 | | |

## PLAQUEMINES PARISH.

| | | | | | | |
|---|---|---|---|---|---|---|
| Upper Magnolia | 1107-1178 | 7,100 | 1.5 | 25,000 | | |
| Little Rock Settlt | 1178-1196 | 1,800 | 1.0 | 4,000 | | |
| Fort St. Leon | 1196-1255 | 5,900 | 1.0 | 11,000 | | |
| Belle Chasse Upper | 1255-1300 | 4,500 | 1.0 | 25,000 | | |
| Belle Chasse Lower | 1380-1407 | 2,700 | 1.0 | 14,000 | | |
| St. Ann | 1407-1459 | 5,200 | 1.5 | 18,000 | | |
| Concession | 1459-1506 | 4,700 | 1.0 | 24,000 | | |
| Oak Point | 1581-1609 | 2,800 | 1.0 | 15,000 | | |
| Cedar Grove | 1609-1679 | 7,000 | 1.0 | 35,000 | | |
| Oakville to Sarah | 1679-1745 | 6,600 | 1.0 | 35,000 | | |
| Live Oak Grove | 1745-1782 | 3,700 | 1.0 | 23,000 | | |
| Dobard | 1801-1835 | 3,400 | 1.5 | 13,000 | | |
| Dobard | 1835-1847 | 1,200 | 2.0 | 3,000 | | |
| Happy Point | 1847-1917 | 7,000 | 1.5 | 27,000 | | |
| Star | 1939-1961 | 2,200 | 1.5 | 9,000 | | |
| Star | 1961-1985 | 2,400 | 2.0 | 6,000 | | |
| Tacoma to Alliance | 1985-2112 | 12,700 | 1.0 | 67,000 | | |
| Alliance | 2134-2166 | 3,200 | 1.0 | ......... | 55,000 | Caving bank new levee will be required. |
| Ironton | 2239-2259 | 2,000 | 1.0 | 10,000 | | |
| Myrtle Grove | 2279-2384 | 10,500 | 1.0 | 54,000 | | Badly wave-washed. |
| Woodpark | 2384-2394 | 1,000 | 2.0 | 2,300 | | |
| Oakland | 2394.2420 | 2,600 | 1.5 | 10,000 | | |
| Larose to Deer Range | 2420-2517 | 9,700 | 1.0 | 50,000 | | |
| Deer Range | 2517-2533 | 1,600 | 2.0 | 4,000 | | |
| Deer Range to West Pointe a la Hache | 2533-2842 | 30,000 | 1.5 | 110,000 | | Levee at Pointe Celeste too near river bank to be enlarged, probable new levee required at Diamond Store through caving of river bank. |
| West Pointe a la Hache | 2842-2867 | 2,500 | 2.0 | 5,500 | | |
| Magnolia | 2867-2891 | 2,400 | | ......... | 40,000 | Caving bank new levee will be required. |
| Magnolia to Riceland | 2891-3072 | 8,100 | 1.5 | 40,000 | | |
| Riceland | 3072-3110 | 2,800 | 1.5 | 15,000 | | |
| | | 159,200 | | 654,800 | 95,000 | |

## RECAPITULATION.

| PARISH | CUBIC YARDS | |
|---|---|---|
| | Enlargemen to M. R. C. Grade | New Levee to M. R. C. Grade |
| Ascension | 39,000 | 4,5000 |
| St. James | 295,000 | 212,000 |
| St. John | 248,000 | 250,000 |
| St. Charles | 218,000 | 135,000 |
| Jefferson | 446,000 | ............... |
| Plaquemines | 654,800 | 95,000 |
| | 1,900,800 | 737,000 |

STATE OF LOUISIANA,
Office Board of State Engineers,
New Orleans, La., Aug. 18, 1903.

*To the Honorable Board of Levee Commissioners, of the Orleans Levee District, Room 14 Masonic Temple, New Orleans, La.*

Gentlemen: We are in receipt of a letter from your Secretary, dated August 14, 1903, and enclosing "four set of plans and specifications for proposed contract work in the Orleans Levee District," and which are transmitted to us for our approval.

We have given this matter due consideration, and beg to submit the following:

First. The plans, location and specifications for the construction of a new levee from Adams to Short Street, left bank, are approved.

Second. The plans, location and specifications for the "enlargement and re-modeling of the Second Street Levee," left bank, are approved.

Third. The plans and specifications for the "Aurora Enlargement," right bank, are approved. In connection with this work, however, we beg to call your attention to the fact that the Aurora levee is in a slightly concave bend of the river, and that an inspection of the soundings of that reach shows rather steep contour lines on the west bank of the river close to the shore where the levee is located. We, therefore, think that this bank at some time, may be subject to caving, and that the lifetime of the proposed enlargement may be of a limited character. At present the line of levee is not endangered by caving, but this may occur at any time, and therefore, we desire to submit this fact to your consideration.

Fourth. The plans and specifications for the "Orleans Enlargement," right bank, are approved.

Very respectfully yours,
*The Board of State Engineers,*
*Per* Arsene Perrilliat,
*Assistant State Engineer.*

---

STATE OF LOUISIANA,
Office Board of State Engineers,
New Orleans, La., June 20, 1902.

*Hon. Jno. Dymond, Prest. Board of Commissioners, Lake Borgne Basin Levee District, New Orleans, La.*

Dear Sir: In accordance with the request of your Honorable Board, as expressed to me at your last meeting on the 16th of May ult., I have examined the present condition of the levees in the upper portion of your district, accompanied by Hon. Lovinsky Nunez, your Inspector.

I would respectfully recommend a new levee, below the sugar house and quarters, in front of the Scarsdale Plantation, to be built before the next high water, as the present levee is liable to be breached this season through the caving of river bank. A line for a new levee, amounting to about 45,000 cubic yards of earthwork, as per enclosed plan, which shows the location thereof as well as the river bank lines up to date, was located at this point some two years ago by the United States Engineer in charge of this district, but was not built in deference to the wishes of the proprietors.

As to the levees in the upper end of the district, from Jackson Barracks to the United States Cemetery, I believe the same can be maintained on their present line by increasing their section and protecting same with revetments, as per enclosed plans and specifications. It will take about 27,500 cubic yards of earthwork to bring these levees up to Mississippi River Commission grade, with increased section; and about 216,725 feet B. M. lumber for revetments to protect same.

This does not include work that should be done in front of the Crescent City Slaughter House Company's property, nor that in front of the United States Cemetery, as these two places require special treatment. The front of the Slaughter House property is situated in a washing bank of the river, and not a caving bank, and for this reason I believe the same can be held for some years to come if heavy sheet piling be deeply driven, well braced, and earth filled in between it and the levee. In front of the United States Cemetery, the river bank here is a caving one, and will require mattressing, otherwise the levees along this stretch will be breached.

The character of work required at these two points, is beyond the means and province of the district, especially where the construction of new levee would not entail very much expense to the district; and I believe should be relegated to the Crescent City Slaughter House Company, Limited, and to the United States Government, respectively.

Respectfully submitted,

Sidney F. Lewis,
*Assistant State Engineer.*

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., March 14, 1903.

*Mr. H. N. Nunez, Secretary Board of Commissioners Lake Borgne Basin Levee District, New Orleans, La.*

DEAR SIR: A copy of the resolutions passed by the Lake Borgne Basin Levee District at its meeting held in New Orleans on the 12th day of March, 1903, and dated March 13th, 1903, which you forwarded to the Board of State Engineers, was duly received.

In answer I will state that two members of this Board, in company with Mr. Jno. Dymond, yourself, and other gentlemen, visited the Ship Island Canal Company Locks, on March 14th, and thoroughly examined the same. At the time of the examination we found no danger of overflow coming from said locks. A slight sloughing in the earthen approaches was noticed on both sides of the front gates of the lock, but in our opinion this was not a source of danger to the levee.

We would suggest, however, that you have this sloughing carefully watched, and, should it develop to any greater extent, then we suggest that the proper remedy would be to fill in the front slope of the earthen approach of levees with loose dirt, so as to widen said approaches, and dry up their land slope.

Very respectfully,
HENRY B. RICHARDSON,
*Chief State Engineer.*

---

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 6th, 1904.

*Hon. Aaron Davis, Prest., and Members, Board of Commissioners, for the Plaquemines Parish East Bank Levee District.*

GENTLEMEN: I beg leave to report that the work done by Dowdle & Windett, contractors, for Section No. 1 Gulf Coast Levee, as certified by me on March 21st, 1904, amounted to 126,800 cubic yards of earthwork, which is approximately one-quarter of the total yardage in Section No. 1 Gulf Coast Levee. As you are aware, nothing has been done on Sections 2 and 3.

I have also certified to 96,235 feet of drainage ditch done by Chas. G. Schayot, contractor, as per reports of your inspector. I have also certified to the construction and placing of 29 drainage boxes in the line of levee by Gustave Favrot, contractor, as per inspection and supervision of your inspector.

The Board of State Engineers is now prepared to advertise for proposals and enter into a contract for the construction of a side levee connecting the upper end of your district with the levee on the Mississippi River front. The survey for this levee has been made, and it is estimated that it will require about 19,000 cubic yards of earthwork.

Yours very respectfully,
SIDNEY F. LEWIS,
*Assistant State Engineer.*

---

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., June 17th, 1902.

*Hon. W. F. Taylor, President Board of Commissioners, Caddo Levee District, Shreveport, La.*

DEAR SIR—In compliance with the request of the Board of Commissioners of your district, as expressed in the minutes of the meeting held on the 14th of May, 1902, to submit a report in regard to the matter brought before the Board by Mr. W. E. Glassell, relative to "digging a ditch to drain certain lands," the Board of State Engineers begs leave to say:

1st. That it understands that the only information herein desired by the Board of Commissioners in regard to the matter, is to whether the ditch proposed by Mr. Glassell would or would not improve the condition of the lands in Soda Lake, still owned by the levee district.

2nd. That it was found, on examination, that the larger part of the lands in Soda Lake, still owned by the levee district, are situated in the low water channel of said lake, which is, and must at times remain for an indefinite period subject to overflow from rain water to a greater or less extent, according to seasons—at least, until far greater changes occur in local conditions than have so far marked the processes of improvement in and about the lake, and called into notice the lands bordering said channel.

3rd. With this statement as to its opinion in regard to the probable varying character of the relief that might be expected for the levee board lands in Soda Lake, by a ditch such as proposed by Mr. Glassell, the Board of State Engineers would add that it believes such a ditch would nevertheless tend to hasten the extension up stream of the natural channel which has for many years been in process of formation below, and thus, in time, greatly improve conditions for the lands in question, though, owing to the extent of the rain shed above, exemption at all times from overflow from rain water should not be expected, with any channel which it would appear practicable to provide.

Respectfully submitted,
*The Board of State Engineers,*
*Per* Frank M. Kerr,
*Assistant State Engineer.*

---

STATE OF LOUISIANA,
Office Board of State Engineers,
New Orleans, La., Sept. 8th, 1902.

*Hon. W. F. Taylor, President Board of Commissioners, Caddo Levee District, Shreveport, La.*

Dear Sir—In compliance with the request of your Board, at its meeting of June 18th last, to make an examination of the river bank at Long Point, Magnolia, Caspina and Campo Bello Plantations, and to report to you with recommendations at your next regular meeting upon the extent and seriousness of the caving at said points, I beg leave to submit the following, viz:

On August 7th, in company with Commissioners Robson and Robinson, I visited the localities named and found the following conditions to exist: At Long Point Plantation, a tendency to cave has recently developed along the lower side of this point, and for a distance of about a quarter of a mile the width of batture between the river bank and the line of levee averages only about 100 feet. The levee line, however, is not at this time in danger of becoming breached, and provision for a new line of levee may be deferred until a future date, dependent upon developments.

At Magnolia Plantation the caving is serious and the line of levee threatened. Least width of batture but 70 feet. A new levee is required. Estimated contents, about 25,000 cubic yards.

At Caspiana Plantation, caving serious, least width of batture being only 137 feet, but levee line not immediately threatened. Further developments should be awaited here before determining upon the location and extent of work required.

At Campo Bello Plantation, caving serious, least width of batture only 85 feet, and steadily extending. New levee required. Estimated contents about 45,000 cubic yards.

Provision for constructing the new levees required at Magnolia and Campo Bello should be made at earliest possible date.

Since the meeting of your Board I was also requested by you to make an approximate estimate of the number of cubic yards of excavation required to dig a ditch from the mouth of Little Pass to a point in Soda Lake about opposite Gum Spring, to aid in relieving certain lands just above, in the vicinity of the mouth of Cottonwood Bayou, from overflow from rain water, when the stages of back water from Red River below would permit, as described by Mr. W. E. Glassell.

In this connection I would respectfully say that this project has already been reported upon to your Board by this department, under date of June 17th, 1902, and with the qualifications therein set forth, reaffirmed herein, beg leave to submit that the number of cubic yards of excavation required to dig such a ditch between the points named should not exceed 60,000.

I expect and shall use every endeavor to be with you at the meeting of your Board on the 17th of this month, and write in advance in regard to the foregoing matters only because I am called upon to make a tour of inspection in the Red River, Atchafalaya and Bayou Boeuf Levee District this week, leaving here to-morrow, and I might not find time between this and the date of your meeting to prepare a written report as desired.

Yours very truly,

F. M. KERR,

*Assistant State Engineer.*

---

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., Jan. 7th, 1903.

*Hon. W. F. Taylor, President Board of Commissioners, Caddo Levee District, Shreveport, La.*

DEAR SIR—The Board of State Engineers has the honor to submit for the consideration of the Board of Commissioners of the Caddo Levee District, at its meeting this day, the following report in regard to the high water of December, 1902, in that part of Red River along which the Caddo Levee District extends, the effects produced by it upon the public levees of the district, and the immediate requirements of the latter resulting therefrom.

Exact statements in regard to the height attained by the river, throughout the length of the district, as compared with previous high waters, can not yet be given, as neither the time nor the opportunity to make the surveys necessary to establish the facts has yet been available, but, from a reconnaissance made at about the time of the highest stage of the river, the following deductions are warranted:

First. From the State line to the vicinity of Dooley's Bayou an elevation of about two (2) feet higher than the high water of 1892 was reached. The highest water of previous record from the State line to the vicinity of Red Bayou was that of 1892; from the vicinity of Red Bayou to the vicinity of Eric's Point that of 1894, the latter being on an average about one foot higher than the high water of 1892 on that part of Red River.

Second. From the vicinity of Dooley's Bayou to the vicinity of Eric's Point, somewhat higher than the high water of 1894—the highest of record for that part of Red River.

Third. From the vicinity of Eric's Point to the vicinity of Shreveport, about equal to the high water of 1894, which, at Eric's Point and at Shreveport, was about one foot lower, and at Cuba Plantation, about midway, about four feet lower than the high water of 1892—the highest of record for that part of Red River.

Fourth. From Shreveport to the vicinity of Lattier's cut-off, somewhat lower than the high water of 1894. On this part of Red River the high waters of 1894 and 1892 were, generally, about equal in height, and were the highest of record.

Fifth. From the vicinity of Lattier's cut-off to the vicinity of Magnolia Plantation, somewhat higher than the high water of 1895—the highest of previous record for that part of Red River.

Sixth. From the vicinity of Magnolia Plantation to the lower end of the district, about equal to that of 1892—the highest of record for that part of Red River.

Notwithstanding this high stage of water, your levee line stood from one and a half (1½) to six (6) feet above it (the greater length of line averaging three feet above the surface of the water at its highest stage), except at the head of Simpson's Lake, and at Hurricane Bluff Place, above Shreveport, and at Long Point, Ashwood and Upper Pascagoula, below Shreveport. At these places, for short lengths, aggregating about one and a half miles, the river threatened to overtop the levees, and it became advisable to raise the two first and the two latter to some extent. As the total length of your levee line is about 78 miles, the extent of precariously low levee in your district proved, therefore, during the high water, to be only about two (2) per cent.

One breach in the line occurred from the succumbing of the levee embankment direct, namely, at the Thompson Place, and three from caving banks, at Magnolia, Whitehall and Campo Bello. Through the first, the river escaped and caused a considerable overflow, but by the prompt and energetic action of the local levee commissioners and riparian proprietors, run-arounds were built and maintained at the three latter.

While the levees at Magnolia and Campo Bello were already more or less threatened by the caving of the river banks, previous to the advent of high water, that at Whitehall was not, and the excessive caving and breach in the levee there was the direct result of the cut-offs through Magnolia and Lovely Points, which took place at about the time of the highest stage in the river at those points. Much alarm was felt at times at several points in the district on account of seepage, but at no place did the alarm prove justifiable.

A fair estimate of the amount of raising and enlarging which should be promptly considered by your district may be easily arrived at, at this time, but the river has not yet, throughout the length of the district, receded sufficiently to permit a full estimate of the probable extent of new levees which may be required in consequence of caving banks.

The Board of State Engineers, therefore, presents to you, to-day, only a preliminary statement of the immediate requirements of the district as follows:

| Name of Levee—Character of Work. | Cubic Yards. |
|---|---|
| ABOVE SHREVEPORT. | |
| Simpson Lake—Raising and enlarging | 15,000 |
| Thompson—New levee | 35,000 |
| Hurricane Bluff—New levee and raising and enlarging | 40,000 |
| BELOW SHREVEPORT. | |
| Upper Eagle Bend—Raising and enlarging | 10,000 |
| Bagley—Raising and enlarging | 25,000 |
| Long Point—New levee and raising and enlarging | 40,000 |
| Woodlawn—Raising and enlarging | 15,000 |
| Ashwood—Raising and enlarging | 25,000 |
| Upper Pascagoula—Raising and enlarging | 30,000 |
| Magnolia—New levee | 30,000 |
| Whitehall—New levee | 25,000 |
| Campo Bello—New levee | 55,000 |
| | 345,000 |

Of the foregoing, the State has already provided for the construction of the new levees at Thompson's, Magnolia, and Campo Bello, amounting to 120,000 cubic yards, leaving your district, therefore, to make provision at this time for about 225,000 cubic yards.

While, as already stated, conditions are not yet ripe to permit a forecast of the requirements of the district beyond its apparently immediate needs, it is safe to say that at no distant day the district may be called upon to additionally supply new levees at Elmer, Wild Lucia and Cedar Bluff, above Shreveport, and at Dixie and Cross Keys, below.

The work from Eric's to Buckhall, above Shreveport, under contract with Hunt and Jordan Bros., was interrupted by high water, but, from information received from the contractors, it is learned that work has already been resumed.

It is also understood that such changes have occurred in the river bank, from caving, and in the elevation of the ground, by reason of washouts, along that part of the line in the vicinity of Pickett Station, on the T. S. & N. R. R., that it may be necessary to reconsider the agreement entered into by your Board with the authorities of the said road September 17th last, in regard to the location of the levee from Station 165 plus 65 to Station 192 plus 80.

However, the Board of State Engineers would suggest that action in regard to this matter be deferred until a special examination of existing conditions can be made, and further recommendations submitted.

Respectfully,
*The Board of State Engineers.*
*Per* Frank M. Kerr,
*Assistant State Engineer.*

---

STATE OF LOUISIANA,
Office Board of State Engineers,
Shreveport, La., April 22d., 1903.

*Hon. W. F. Taylor, President Board of Commissioners, Caddo Levee District, Shreveport, La.*

Sir—At the meeting of the Board of Commissioners of the Caddo Levee District of January 7th, 1903, the Board of State Engineers submitted a report in which levee work at Simpson Lake, Hurricane Bluff, Upper Eagle Bend, Bagley, Long Point, Woodlawn, Ashwood, Upper Pascagoula, and Whitehall, estimated at 240,000 cubic yards of earthwork was recommended for construction, all of which, with the exception of the work at Simpson Lake, estimated at 15,000 cubic yards, has been put under contract.

The Board of State Engineers now desires to recommend additional levee work for construction at the following named places, viz:

| Localtiy. | Approximate contents cubic yards. | Remarks. |
|---|---|---|
| ABOVE SHREVEPORT. | | |
| Cavitts | 110,000 | |
| Elmer | 40,000 | |
| Wild Lucia | 55,000 | |
| Cedar Bluff | 25,000 | |
| Sterling Bayou | 20,000 | |
| | | 250,000 Cu. yds. |
| BELOW SHREVEPORT. | | |
| Logie Lea | 105,000 | |
| Cross Keys | 95,000 | |
| | | 200,000 Cu. yds. |

RECAPITUATION.

| | |
|---|---|
| Above Shreveport | 250,000 cubic yards. |
| Below Shreveport | 200,000 cubic yards. |
| Total | 450,000 cubic yards. |

| | Cu. Yds. |
|---|---|
| Amount previously recommended and undertaken by the district | 240,000 |
| Contracts holding over from last season, not yet completed (Eric to Buckhall) | 360,000 |
| Total under contract and additional work recommended | 1,050,000 |

The cost of the district work under contract to date is approximately $80,000.

At Cavitt's, the distance from the centre of the levee to the river bank is only 75 feet, and the bank will continue to cave seriously.

This levee is quite a large one, averaging about 12 feet in height, and is situated just above Red Bayou.

At Elmer, the distance from the centre of the levee to the river bank is only 45 feet, and the bank will continue to cave seriously.

This levee will average about 9 feet in height, and is situated but a short distance below the Thompson crevasse.

With the prospect of a breach in the line of levee at Elmer it would be useless to close the break at Thompson's.

At Wild Lucia, the distance between the centre of the levee and the river bank is still as much as 135 feet, but the levee is situated on the concave side of an abrupt bend, and continued serious caving must be feared.

At Cedar Bluff the distance between the centre of the levee and the river bank is still 165 feet, but the levee is situated on the upper side of a point in a narrow part of the river, across which high water seeks to flow with great energy, and continued serious caving may be expected there. This line of levee, too, is considerably overgrown with young cottonwood trees, etc. The average height of the Cedar Bluff Levee is about 10 feet.

At Sterling Bayou, the distance between the centre of the levee and the river bank is only 125 feet. This levee does not average much more than about 6 feet in height, generally, and but for the fact that it crosses a bayou, where the fill is probably about 20 feet, its construction might be deferred for the present.

At Logie Lea, the river bank has already caved into the river slope of the levee, and the latter may be, practically, regarded as breached, with continued serious caving to follow.

Recognizing the urgency of dispatch in building new levees at points where breaches exist, or are soon likely to occur, and the contractor for the Upper Pascagoula enlargement being on the ground, but still unable on account of the soggy condition of the batture to proceed with the enlargement work, he was furnished with lists of dimensions and specifications for a part of the Logie Lea Levee, and directed to proceed with the work there.

Your approval of this course is respectfully asked.

At Cross Keys, the levee line is breached for a length of about 900 feet, and there is no recourse left for the district but to build a new levee there with the least possible delay.

At Long Point, continued caving necessitated changes in the locations of Section Nos. 1 and 3, but by withdrawing, for the present, the enlargement work, known as Section No. 2, which is, hereby, under the circumstances, recommended, the yardage under the Long Point contract will not be materially increased.

At Whitehall it was finally decided to build the short line across the Point, calling for some 8,000 cubic yards of earthwork less than in the longer line at first adopted.

Considerable anxiety having been expressed about conditions at Dixie and Upper Eagle Bend, a special visit was again made to these places yesterday, after the completion of examinations throughout the balance of the district.

The situation at Dixie does not, at this time, appear to demand the immediate construction of a new levee there. The least distance between the centre of the levee and the river bank is 170 feet, and the bend seems to be growing less abrupt and somewhat less sensitive to caving than at one time apparent.

At Upper Eagle Bend the changes in the river bank are not yet serious enough to require the construction of a new levee there. In fact, in the light of the number of new levees required in the district at this time, the contract for raising and enlarging this levee might even be cancelled.

As reference is quite often made herein to caving banks, and an exaggerated impression might thus be given of the extent thereof, it might be well to state that the length of levee line in the district so far breached and still seriously affected at this time by caving banks is after all only about 10 per cent. of the total length of levee line thus far built in the district.

It should, of course, be the first duty of the district to provide for new levees, where breaches in the line have occurred, or are imminent, but after this has been accomplished, it is to be hoped that means may become available to permit the district to undertake a certain amount of raising and enlarging along particular reaches of the river, notably along certain stretches of the line from the State line to the lower side of Dooley Bayou.

Particulars in regard to this cannot at this date be given, but surveys will be made as soon as the other pressing work at present in hand will permit, and a special report on the subject be submitted.

The camps for the accommodation of the forces of the Board of Control of the State Penitentiary, which are to be employed on the State work at Thompson's, are nearing completion, and the forces are expected to be on the ground to-day.

At this point, a change of location, on account of new conditions, due to the second flow through the crevasse, was rendered necessary and made, materially increasing the contents and cost of the work.

At Magnolia, another one of the levees under construction in the district payable from State funds, conditions have materially improved, and the new levee there is well advanced towards completion.

At Campo Bello, where the new levee work is also payable from funds provided by the State, changes in the location of the line due to further caving, have also been made, considerably increasing the contents and cost of the work there, as well. Work upon this levee, due to abnormal conditions of river and weather, is considerably behind, but will be prosecuted with vigor from this time on.

The contents of the work under way at Thompson's, Magnolia and Campo Bello, to be paid for with funds provided by the State, aggregates about 160,000 cubic yards, costing about $29,000.

Contractors are on the ground at Hurricane Bluff, Long Point, Logie Lea, and Whitehall, and are making fair progress with the forces employed.

The Hurricane Bluff Levee is about completed.

Owing to high water the contractors for the Eric to Buckhall Levee were driven off the ground and have not yet resumed work there, but expect to do so during the course of this week.

On account of washouts some changes in the location of this work are also necessitated, but these will not materially increase the yardage already provided for it.

It is respectfully urged that an active, energetic and competent inspector be employed to supervise and report upon details of construction on the levees below Shreveport, and to enforce the ordinances of the district and the laws of the State governing the care, maintenance and preservation of the levees of the district.

An inspector is already on duty on the line above Shreveport.

Respectfully submitted,
*The Board of State Engineers,*
*Per* Frank M. Kerr,
*Assistant State Engineer.*

---

STATE OF LOUISIANA,
Office Board of State Engineers,
New Orleans, La., Sept. 15, 1903.

*Hon. W. F. Taylor, President Board of Commissioners, Caddo Levee District, Shreveport, La.*

Sir—Matters of business here this week of much importance preclude my being present at the meeting of your Board to-morrow, the 16th inst., and, as information relative to the progress of the levee work of the season in your district, and to the condition of the levee line generally, will no doubt be desired, I beg leave to submit the following statement showing the levee work undertaken by the Board of Commissioners of the Caddo Levee District under contracts entered into since February 4th, 1903, and the progress made thereon to date:

| Name of Levee | Contents Cu. Yds. | Price Cents | Cost | REMARKS |
|---|---|---|---|---|
| (Above Shreveport) | | | | |
| Cavitt | 100,000 | 17.40 | $ 17,400.00 | New levee 10 per cent. of earthwork in position |
| Wild Lucia | 78,500 | 15.40 | 12,089.00 | New levee 95 per cent. of earthwork in position |
| Hurricane Bluff | 48,434 | 13.40 | 6,490.15 | New levee. completed |
| | (226,934) | | ($35,979.10) | |
| (Below Shreveport) | | | | |
| Bagley | 39,000 | 16.25 | 6,337.50 | Enlargement 80 per cent. of earthwork in position |
| Long Point | 59,094 | 16.25 | 9,602.77 | New levees, completed |
| Woodlawn | 13,166 | 16.25 | 2,139.47 | Enlargement, completed |
| Ashwood | 20,000 | 16.25 | 3,250.00 | Enlargement, completed |
| Pascagoula Bayou | 5,600 | 16.25 | 910.00 | Enlargement, extension to Ashwood contract, completed |
| Upper Pascagoula | 3,375 | 16.25 | 548.44 | Enlargement, completed |
| Logie Lea | 102.339 | 16.25 | 16,630.08 | New Levee, extension to upper Pascagoula contract, completed |
| White Hall | 30.363 | 14.69 | 4,460.32 | New levee, completed |
| Cross Keys | 94,393 | 17½ | 16,518.77 | New levee, completed |
| | (367,330) | | ($60,397.35) | |

---

## RECAPITULATION:

| | | | | |
|---|---|---|---|---|
| Above Shreveport | 226,934 | Cu. Yds. | Costing | $ 35,979.15 |
| Below Shreveport | 367,330 | " " | " | 60,397.35 |
| Totals | 594,264 | " " | " | $ 96,376.50 |

As you may note, the only one of the foregoing pieces of work upon which proper progress has to date not been made is the Cavitt Levee, to which fact the attention of the contractor should be promptly called.

*Statement showing levee work undertaken in the Caddo Levee District by the State under contracts entered into since February 4th, 1903, and progress made thereon.*

| Name of Levee | Contents Cu. Yds. | Price Cents | Cost | REMARKS |
|---|---|---|---|---|
| Thompson | 59,743 | 22¾ | $13,591.53 | New Levee, Completed $1500 additional paid by Caddo Levee Dist. |
| Elmer | 53,000 | 22¾ | 12,057.50 | New Levee, extension to Thompson contract, completed. |
| | 112,743 | | $25,649.03 | |

At this date, February 4th, 1903, the levee district already had under construction a new levee extending from Eric's to Buckhall. The extent of this work, when undertaken, was estimated at 360,000 cubic yards, costing $48,420. On May 6th, 1903, however, the

Board of Commissioners, by resolution, agreed, on account of the absence of means to proceed with other works of more immediate importance in the district, to permit the contractors to temporarily suspend operations on this work, and to measure up and receive all that part of the completed line extending from Station 0 to Station 165+65, and from Station 193+80 to Station 217. These parts of the line were duly completed by the contractors, measured up and received, and a certificate for 226,975 cubic yards issued thereon on June 29th, 1903.

The cost of this work up to that date was, therefore, at the price stipulated in the contract, 13.45 cents per cubic yard, $30,528.13.

At the same date, February 4th, 1903, the State also already had under contract in the district new levees at Magnolia and at Campo Bello. These new levees, amounting to 99,468 cubic yards, and costing $15,160.50, are completed and received, and certificates in final settlement have been issued on them.

With the completion of all the foregoing levee work, the line of public levee upon which the Caddo Levee District is now dependent for protection from overflow will again be continuous from Blanton, Ark., to Gold Point Plantation, above Shreveport, and from the north bank of Bayou Pierre to the lower boundary of the Caddo Levee District below Shreveport.

While much of the line, on account of weeds, the growth of small trees, the wear and tear of time, weather and travel, road crossings and pathways, the rooting of hogs, etc., is not in as good condition as it should be, by far the greater part of it will compare favorably in location, grade, section and appearance with the best in the State.

It seems more than probable, however, at this date, that new levees will be needed in the district at no distant day from Elmer Slough to Coushatta Place, at Cedar Bluff, and at Sterling Bayou, above Shreveport, and at Dixie, Mussers, Upper Magnolia, and lower Cross Keys, below Shreveport.

Among the works of first importance to the district, recommended at the beginning of the season for improvement, was the enlargement of the Simpson Lake Levee. This work has not yet been placed under contract. Every effort should at once be made to do so.

An inspection of the entire line of public levee in the district will be made within the course of the next thirty days, after which a special report will be submitted in regard to the points threatened by caving banks and such parts of the line as require cleaning off and repairing, with recommendations in regard to the manner in which the work required should be undertaken and executed.

Please advise me of any service desired, and it will be promptly considered and attended to.

Respectfully,

FRANK M. KERR,
*Assistant State Engineer.*

---

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
SHREVEPORT, LA., Dec. 16, 1903.

*Hon. W. F. Taylor, President Board of Commissioners, Caddo Levee District, Shreveport, La.*

DEAR SIR—I have the honor to report to you at this meeting that all of the levee work undertaken in the Caddo Levee District by the District and the State since the last high water has been completed, with the exception of the Simpson Lake Levee and the Cavitt Levee.

The work required on the Simpson Lake Levee has only just been well started, but with a continuance of good weather it should be completed within the course of a month.

Work on the Cavitt Levee is progressing favorably, and the levee is at this date something more than half completed.

With the completion of these two levees the lines of public levee in the Caddo Levee District, extending from Blanton Bluff to Gold Point, above Shreveport, and from the north bank of Bayou Pierre to the lower end of the District, below Shreveport, will, within their limits, be once more restored to a continuous and efficient grade and section, and will be entitled to rank among the very best in the State.

The wear and tear of time and of the elements, the abuses of man and beast, the burrowing of animals, and the caving of banks are agencies, however, which are ever at work to a greater or less degree, first here, then there, to more or less injuriously affect their integrity.

As it is the duty of your Board to at all times maintain a faithful supervision over the levees of the district, to remedy any and all deteriorations that may develop in the levees, and to correct abuses inflicted upon them, in other words, to preserve their life, I have thought it well at this time to herein again call your attention to the present condition of your levees in certain localities, to-wit:

On the Thompson, Doles, Peru and Egypt places, a burrowing animal, commonly known as the salamander, has attacked the levees in quite a number of places. If not checked in its ravages upon the levees in these localities, the integrity of your lines of protection must eventually be greatly impaired. I am not prepared at this meeting to suggest any effective remedy, and it will be well, it appears to me, for your Board to appoint a committee to look into the subject and report at your next regular meeting.

The woods for quite a distance above and below Dooley Bayou, above Shreveport, and at the Bagley and Riverdale places, below Shreveport, closely hug the line of levee, keeping it shaded to the detriment of its sod, inducing the growth of weeds, briars, etc., and rendering the levee liable to injury from falling timber. Along all these stretches the timber should be slashed for a distance of 100 feet each side of the line, and the levee cleaned off, repaired and regrassed.

Weeds, briars, small trees, etc., have been permitted to grow on quite a number of stretches of levee in the District, notably on the lower part of Missionary, Dooley Bayou, Peru, Cedar Bluff, and Crescent Place, above Shreveport, and at Dixie, below Shreveport. These lines of levee should be cleaned off and properly repaired and re-grassed.

Since the subsidence of the last high water, no serious changes in the river bank above occurred along the front of your district, but with a return of high water, considerable changes may be looked for at a number of places, notably from Elmer Slough to Coushatta Place, at Cedar Bluff, Sterling Bayou, Dixie, Riverdale, Long Point, Mussers, Magnolia, and lower Cross Keys.

Should levees become necessary in the near future at all of these points, as seems likely, the District would have to provide for the construction of some 600,000 cubic yards of earthwork.

Provision should, too, at the earliest possible time, within the means of the District, be made to raise and enlarge the present line of levee from Blanton Bluff to Scott's Slough, above Shreveport, and at Rush Bayou, below Shreveport, involving about 200,000 cubic yards of earthwork, not to mention the extension of the levee line from Gold Point south towards Shreveport, upon which a special report has already been submitted.

Respectfully,
*The Board of State Engineers,*
*Per* Frank M. Kerr,
*Assistant State Engineer.*

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., Aug. 21, 1902.

*Hon. J. W. Jeter, President Board of Commissioners, Bossier Levee District, Shreveport, La.*

DEAR SIR—An inspection of the entire line of levee in the Bossier Levee District was made during the past week, and the following report in regard to the condition of the line, with recommendations, is respectfully submitted for your early consideration, viz:

*Willow Bend.*—Upper portion repaired last season by the State, to remedy the burrowing of salamanders, somewhat worn and disfigured in places by rain wash, but section generally full. Grass, however, has not yet spread well, and levee getting very weedy. Lower portion section full, but generally weedy, parts of line obscured by weeds.

*Lassiter's.*—Upper portion, section full and well grassed, but lower section mostly obscured by weeds, vines, briars, etc.

*Rough and Ready.*—Section worn and ragged in places, but generally full and well grassed, though weedy in spots. Defective ramps at upper and lower limits. Caving continues all along front, but width of batture safe at this date—not less than 400 feet anywhere.

*Willow Chute.*—Section somewhat worn and ragged, at crossings over old river dike, at upper end, but generally full, clean and well grassed. Caving opposite lower arm of old river (Willow Chute) serious, and a new levee covering threatened breach in line required.

*Honey Grove.*—Section generally full, though somewhat ragged in places. Well grassed, though very weedy along a portion of the line. Fence posts have been recently imbedded in levee at line between Honey Grove and Gordy Ogden's, and should be removed.

*Gordy Ogden's.*—Except for the stretch of levee above the new levee of 1901, section full, clean and well grassed. This stretch is ragged in places and obscured by weeds.

*Gold Point.*—Section full and well grassed, though somewhat weedy in spots.

*Riverside.*—With exception of upper wing, section full and well grassed, though weedy in spots. Upper wing ragged, obscured by weeds, and scantily grassed.

*Buckhall.*—Section mostly full and well grassed, but generally weedy. Encroachment of bank along stretch of levee in front of residence and improvements, increases slowly, and the construction of a new levee here cannot be deferred much longer.

*Cash Point.*—Section full and well grassed, but generally weedy. Parts of line obscured by weeds. Defective ramp at angle in point, and at approach to ferry opposite upper side of public lane. Caving continues along upper and lower sides of point, but width of batture safe at this date.

*Shady Grove.*—Section full and well grassed, though somewhat weedy in spots.

*Benoit Bayou.*—Section full and well grassed, but very weedy. Caving continues and considerable changes in bank may be expected, unless cut-off through Southside occurs.

*Pandora.*—Section full and well grassed, but somewhat weedy in spots. Defective ramp near gin. Caving at upper end continues, but width of batture safe at this date.

*Carmouche.*—Section low and scant as compared with line above and below. Otherwise clean and well grassed. This line of levee should be raised and enlarged as son as means are available.

*Jeter's.*—Section full and well grassed, though weedy in spots.

*Colquitt's.*—Section full, clean and well grassed, except in vicinity of residence, where levee is very weedy.

*Pat Cash's.*—Upper portion, section full and well grassed, but quite weedy. Caving in bend continues, but width of batture safe at this date. Lower portion, unimporved levee; section scant, ragged, and obscured by weeds. No recent material changes in bank. Line should be improved as soon as means are available.

*Hollingsworth's.*—Section generally fair, though somewhat reduced and disfigured by rain wash after completion. Well grassed, but weedy and unkept in appearance. Defective ramp at lower end.

*Dillard's.*—Upper portion of line, section good, clean and well grassed. Lower portion, section good and well grassed, but weedy in spots. Defective ramp opposite improvements.

*Bossier City to Dillard's.*—Section generally good, but ragged in spots and weedy. Several pathways through levee.

*Bossier City.*—Section generally full, but lower half, occupied by railroad switch, weedy and unkept, and upper half being gradually crowded by bridges and waste to sawmills and box factories, all of which must eventually prove injurious to levee and render it unsafe.

*Bossier City to Vinson Bayou.*—Section full, clean and well grassed, except on lower wing, which is very weedy. Defective ramps next to railroad embankment and on upper side of Vinson Bayou.

*Vinson Bayou to Alexander and Blanchard's.*—Section full, but overgrown with weeds, vines, etc. Deep pathway just below over bayou just below Belcher residence.

ever bayou just below Balcher residence.

*Alexander and Blanchard's.*—Section largely deficient from hog roots, and encroachment of road upon levee. Two deep pathways through levee, and entire line overgrown with weeds, brush, vines, etc.

*Mack's Bayou to Schenick's Bayou.*—Section full, clean and well grassed. Banquette across Mack's Bayou, however, much worn down by travel. Dangerous road gap through levee just above dike across Mack's Bayou.

*Chalk Level.*—Section full and well grased, but lower half of line very weedy. Caving from just below Schenick's Bayou to point opposite residence continues, but width of batture apparently safe at this date.

*Clay Place.*—Section full and well grassed, but weedy in spots. Defective road crossing opposite horse lot, and two deep pathways through levee.

*Nicholson's.*—Section generally full, clean and well grassed. Banquette across old crevasse much worn and disfigured by travel. Caving continues near upper line, but width of batture safe at this date.

*Upper Sunflower.*—Section full, clean and well grassed. Two deep pathways through levee. Caving continues near lower line, but width of batture safe at this date.

*Lower Sunflower.*—About one-half of length of line in fairly good condition, balance somewhat ragged and scant in section, slope on land side generally only 2 to 1, except on new levee above Curtis. A number of pathways through levee.

*Curtis.*—General condition of line fair, though ragged in spots, from wave wash, hog roots, and encroachment of road. Clean and well grassed. Couple of pathways through levee, and one road cut, with defective ramp. Slope on land side only 2 to 1.

*Richmond Bayou.*—Section full, clean and well grassed. Banquette across upper bayou (Charles Bayou) scant and narrow.

*Pruitt's.*—Section full, clean and well grassed. Caving continues in bend and along lower reach, but width of batture still safe at this date.

*Hall's.*—Across Point: Section full and well grassed, but weedy. New Levee; lower side of Point: Section full, but obscured by rank weeds.

*Childer's.*—Section full and well grassed, but a large part of line very weedy.

*Scopini.*—Section full, clean and well grassed. Caving continues, but width of batture still safe for some time to come.

*Grappe Place.*—Section full, clean and well grassed.

*Phillip's Place.*—Section full, clean and well grassed.

*Ash Point* (*Dortch*).—Section full, clean and well grassed. Caving serious but width of batture safe at this date—not less than 250 feet at any point. Defective ramp opposite residence.

*Mercer's.*—Line generally in good condition, clean and well sodded, but somewhat scant in section and ragged in appearance in vicinity of residence. Defective ramps opposite residence and gin house.

*Waterloo.*—Section full, clean and well grassed.

*Magenta.*—Section and condition generally good, but a large part of line very weedy. Defective ramp opposite store.

*Gold Dust.*—Section full, clean and well grassed. Caving serious and new levee required. Least width of batture at this date 125 feet.

*Hopewell.*—Section full, clean and well grassed. Caving serious and new levee required. Least width of batture at this date 97 feet.

*Elm Grove.*—Section full, clean and well grassed. Considerable caving but width of batture still safe at this date.

*Whitehouse Place.*—Section full and well grassed, but somewhat weedy in places. Two pathways through levee and one defective ramp near residence.

*Bates.*—Section full, clean and well grassed. No material changes in bank.

*Knox Point Place.*—Section generally full and well grassed, but somewhat weedy. Defective ramp back of site of old store, and levee somewhat ragged and scant in places for short distance above. Caving continues, but width of batture still safe at this date.

*Knox Point Place to Lovely Point.*—Except for stretches at upper and lower limits, section full, clean and well grassed. For about 1,000 feet below upper limit, somewhat ragged and worn, especially opposite store and barn, and line weedy. For about 1200 feet above lower limit, section full, but obscured with vines, weeds, etc. One defective ramp.

*Lovely Point.*—Section full, clean and well grassed. Model looking levee. Considerable caving along lower side of Point—width of batture not more than about 200 feet for quite a stretch about 1,000 feet above gin. Defective ramp opposite residence.

*Glenwood (A. J. Moss).*—Section generally full. About 300 feet at lower and somewhat disfigured from hog roots. A few bald spots on surface, but line generally fairly clean and well grassed. Slopes disfigured in spots by old pathways and rain wash. Defective roadway near lower line.

*China Grove.*—Section generally full, clean and well grassed, though there are some bald and ragged spots here and there, especially opposite site of residence. Deep pathways through levee just below lane. Defective ramp in lane and levee much worn by crossings.

*From China Grove to Christiana.*—Section full, but, though well grassed, weedy and considerable growth of small cottonwood trees. One deficient road crossing and two pathways.

*Christiana.*—Section full, clean and well grassed, except along stretch above point, where levee is weedy and there is a considerable growth of small cottonwood trees. Defective crossing near upper end of place, and pathway in angle at upper spur. Serious caving along lower side of point, and new levee required.

*Sixteenth Section.*—Section generally full, though well grassed, weedy and overgrown with young cottonwood trees in places. One defective roadway.

*Buckhorn.*—Section generally full, clean and well grassed. Caving opposite Campo Bello cut-off continues serious, but width of batture still safe at this date—least width 500 feet.

*Bear Point.*—Section full and well grassed but weedy in places.

The lower end of the line of public levee in the Bossier Levee District is, at this time, located on lower bank of Ninock Lake, on the Dennison Plantation, leaving still an unleveed length of line from that point to the lower boundary of the district of about five miles by river.

The recommendations of the Board of State Engineers in regard to new levees, enlargement and repairs required, named in the order of their relative importance, are submitted as follows, viz:

(1) NEW LEVEES REQUIRED.

| | | | | |
|---|---|---|---|---|
| 1. | Willow Chute, about.......... | 25,000 | cubic | yards. |
| 2. | Gold Dust, about............. | 35,000 | “ | “ |
| 3. | Hopewell, about ............. | 35,000 | “ | “ |
| 4. | Christiana, about ............ | 20,000 | “ | “ |

(2) ENLARGEMENT REQUIRED.

| | | | | |
|---|---|---|---|---|
| 1. | At Pandora, about............ | 15,000 | “ | “ |
| 2. | At Pat Cash's (partly new levee and partly enlargement) about .................. | 30,000 | “ | “ |

(3) REPAIRS REQUIRED.

The line, as shown in the foregoing description, requires cleaning off in many places, on account of weeds, brush, bushes and other growths, and a good deal of it has been either impaired, reduced in section, cut through by roadways and pathways, or disfigured by hog roots and the encroachment of the public and private roads upon its base.

Methods and means should be promptly devised by your Board to remedy these defects.

Respectfully submitted,
*The Board of State Engineers,*
*Per* Frank M. Kerr,
*Assistant State Engineer.*

---

STATE OF LOUISIANA,
Office Board of State Engineers,
New Orleans, La., Dec. 29, 1902.

*Hon. W. B. McCormick, President Pro Tem. Board of Commissioners, Bossier Levee District, Shreveport, La.*

Dear Sir—Having been advised by you that a special meeting of the Board of Commissioners of the Bossier Levee District had been called to meet at Bossier City on Tuesday, December 30, 1902, at which it was desired that I should be present, I take it for granted that a preliminary report, touch upon the recent high water in Red River, its effect upon your levee line, and the immediate requirements of the district in consequence thereof, will be expected at this meeting from this department, and, therefore, beg leave to submit the following, based upon a reconnaissance of the line of levee in the district at about the time of the highest water.

Opportunity and time to obtain the necessary information to permit exact statements have not yet been given, but, along the front of the Bossier Levee District it can be safely estimated that the high water of December, 1902, compared in height with the high waters of the past in Red River, about as follows:

(1) From the upper end of the district (Willow Bend Plantation) to the vicinity of Rough and Ready Plantation, it was somewhat higher than the high water of 1894—the highest of previous record for that part of Red River.

(2) From the vicinity of Rough and Ready Plantation to the vicinity of Shreveport, about equal to the high water of 1894, which, at Rough and Ready Plantation and at Shreveport, was about 1 foot lower and at Pandora, about midway, about 4 feet lower than the high water of 1892—the highest of record for that part of Red River.

(3) From Shreveport to the vicinity of Curtis' Place, somewhat lower than the high water of 1894. On this part of Red River the high waters of 1894 and 1892 were, generally, about equal in height, and were the highest of record.

(4) From the vicinity of Curtis' Place to the vicinity of Knox Point, somewhat higher than the high water of 1895—the highest of previous record for that part of Red River.

(5) From the vicinity of Knox Point to the lower end of the district, about equal to that of 1892—the highest of record for that part of Red River.

In spite of the extreme height of the water thus generally prevailing in the river along the leveed front of your district during this period, upon but one stretch of your line did the river threaten to overtop the levees. This was upon what is known as the Dortch-Mercer Levee, where some raising and backing was done, in short lengths, aggregating about one quarter of a mile in length. Comparing this with the total length of your levee line—at this time about 58 miles—the very extraordinary showing follows that less than one-half of 1 per cent. of your levee line was at any time in danger of being overtopped by the river. All other parts of the line stood from 2 to 6 feet above it.

While seepage was, as is usual, during high water, general, and at some points very pronounced, at no point did it grow serious enough to call for any special efforts to check its effects.

Excessive caving, however, occurred at quite a number of places, notably at Willow Chute, Gold Dust, Hopewell, Christiana and Buckhorn, and gave cause for grave apprehension for the safety of the levee lines there.

At all of these places the existing levee appeared at a number of times during the period of high water, threatened by breaches from the caving of the river bank, and at Willow Chute, Christiana and Buckhorn, provision had to be made for run-rounds in anticipation of such an emergency.

The stage of the water in Red River, though steadily declining, is still high, and you will, therefore, understand that further developments are more than likely to occur which might materially affect any statement now made in regard to the immediate requirement of the district, but, even at this time, the following is self-evident: The early completion of the new levees at Willow Chute, Gold Dust, Hopewell and Christiana, and provision for a new levee at Buckhorn, and for raising and enlarging the Dortch-Mercer Levee.

The new levees at Willow Chute and Christiana have already been provided for by the district, and those at Gold Dust and Hopewell by the State, leaving, therefore, among the requirements above stated, only the new levee at Buckhorn, and the raising and enlargement at the Dortch-Mercer Levee to be immediately considered by your Board.

On account of the caving of the river bank at Willow Chute, a change in the location of the new levee, under contract there, was necessitated, but the additional yardage required in consequence of the change will not exceed 5,000 cubic yards.

For the construction of the new levee at Buckhorn not more than about 25,000 cubic yards of earthwork will be required.

To raise and enlarge the Dortch-Mercer Levee will require about 60,000 cubic yards. However, on account of caving, it may, upon further examination, prove advisable not to raise and enlarge that part of the line extending along the upper part of the Dortch Place, and a new levee there would increase the yardage for this line to about 140,000 cubic yards.

The aggregate of this immediate work is, therefore, only about 170,000 cubic yards. But, if the new levee at Dortch's can be delayed, provision for only about 80,000 cubic yards is necessary.

When, however, more time has been afforded for future developments, in the near future, at these and other places in the district, and the necessary examinations and surveys have been made, the requirements of the district may certainly be estimated to greatly exceed the quantities here given, it being, at this time, alone evident that new levees should be built at Buckhall and Gilmer Lane above Bossier City, and that the Scopini Levee, below, should be raised and enlarged.

Very respectfully submitted,
*The Board of State Engineers,*
*Per* FRANK M. KERR,
*Assistant State Engineer.*

---

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., May 4, 1903.

*Hon. W. B. McCormick, Prest. Board of Commissioners, Bossier Levee District, Shreveport, La.*

DEAR SIR: The levee work recently completed, and still under contract, in the Bosier Levee District, payable from funds to be provided by the district, is as follows:

| Name of Levee. | Contents, cubic yards. | Price per cu. yd. | Cost. | Remarks. |
|---|---|---|---|---|
| Willow Chute, N. L... | 23,547 | 13.90 | $ 3,273.02 | Final Cert. issued. |
| Buckhall, N. L........ | 18,227 | 15.69 | 2,859.81 | Final Cert. issued. |
| Dortch, N. L.......... | 110,000 | 17.80 | 19,580.00 | Under way. |
| Mercer En'l'g't........ | 30,000 | 16.70 | 5,010.00 | Not yet begun. |
| Christiana, N. L...... | 21,370 | 13.37 | 2,857.16 | Final Cert. issued. |
| Buckhorn, N. L....... | 22,450 | 15.90 | 3,569.55 | 95% done. |
| | 225,594 | | $37,149.55 | |

The levee work under contract in the district at this time, payable from funds to be provided by the State, is as follows, viz:

| Name of Levee. | Contents, cubic yards. | Price per cu. yd. | Cost. | Remarks. |
|---|---|---|---|---|
| Gold Dust ........... | 75,000 | 15.45 | $11,587.50 | 75% done. |
| Hopewell ............. | 85,000 | 15.45 | 13,132.50 | 35% done. |
| | 160,000 | | $24,720.00 | |

Additional levee work is now required in the district, as follows, viz:

| Name of Locality. | Contents, Cu. Yds. | Remarks. |
|---|---|---|
| Rough and Ready | 55,000 | New Levee. |
| Pat Cash's | 30,000 | New Levee and Raising and Enlgt. |
| Scopini | 80,000 | New Levee. |
| Dortch Extension | 145,000 | New Levee. |
| Van Hoose | 50,000 | New Levee. |
| Total | 360,000 | |

All of this work has become necessary in consequence of caving banks.

At Rough and Ready, the caving bank has fortunately worked down stream. Along that part of the river bank opposite the lake the extent and rate of caving has materially diminished, and conditions along there have greatly improved, but from the angle in the levee below the lake down to a point near Old River, conditions have grown more serious, the distance between the centre of the levee and the river bank, at one point, being only 150 feet, with every indication of continued extensive caving.

At Pat Cash's the river bank has caved into the slope of the levee, at the angle just above the negro church. The bank along here is, however, high, and it requires an acute stage of water in the river to even cover it, so that in view of the present limited means at the disposal of the district for other more important work, the construction of a new levee here might be temporarily deferred.

At Scopini, extensive caving occurred during the high water of last December and March, the distance between the centre of the levee and the river bank being now reduced at one point—opposite the crevasse hole—to only 215 feet. The levee which is threatened here is on the concave side of a bend along which continued caving may be expected.

The importance to the Bossier levee district of maintaining this line is too well understood to require any special argument.

At Dortch's, the caving which developed during the high water of December, was greatly increased during that of March, extending up stream to a point opposite the lower tangent of the U. S. Scopini levee, where the distance between the centre of the levee and the river bank is now only 75 feet.

A breach in the line of levee here would result as seriously to the district as one in the Scopini levee.

At Van Hoose's, the distance from the centre of the levee to the river bank is, in several places, not more than 100 feet.

The bank along the levee line at Van Hoose's has been caving slowly for quite a while past, but has recently been greatly increased by the presence of a cut-off across the lower neck of Parcagoula Point, which occurred during the high water of March.

Continued serious caving may be expected here, extending on up into Elm Grove.

In consequence of the number of new levees thus required in the district, and others which may still become necessary, the Board of State Engineers would suggest the temporary withdrawal from the contract of the enlargement work at Mercer's (30,000 cubic yards).

The Board of State Engineers is pleased to be able to announce, also, that it has been found possible for the State to undertake the construction of the new levee required at Van Hoose's, in addition to that under way at Gold Dust and Hopewell.

The Board of State Engineers selects the new levee at Van Hoose's for construction by the State, as the cost will just about come within the amount of its funds still available at this time for the Bossier Levee District, and because it is expected to arrange to have it built as an extension to the Gold Dust Hopewell contract, already under way in the district, and but a short distance above it.

Temporarily deferring the construction of the new levee at Pat Cash's (30,000 cubic yards), withdrawing the enlargement of the Mercer Levee from contract (30,000 cubic yards), and the State undertaking the construction of the new levee at Van Hoose's (50,000 cubic yards), the number of cubic yards of earthwork for which the district is called upon, at this time, to provide. is, therefore, reduced from 360,000 to 250,000 cubic yards.

The care and preservation of the levees in the district is still not receiving proper attention from the authorities, and unless intelligent and systematic measures are soon inaugurated to check the abuses to which the line is in many places often subjected and to repair deficiencies already caused by abuses and the wear and tear of time, its security as a whole cannot long be relied upon.

Respectfully submitted,

*The Board of State Engineers,*

Per Frank M. Kerr,

*Assistant State Engineer.*

STATE OF LOUISIANA,
Office Board of State Engineers,
Alexandria, La., May 14, 1903.

*Hon. J. G. White, President Board of Commissioners, Red River, Atchafalaya and Bayou Boeuf Levee District, Alexandria, La.*

Dear Sir: Assuming that it would prove interesting to you and the members of your Board, at the meeting to be held this evening, to receive some statement from the Board of State Engineers in regard to the high water of this year in the streams affecting the district, the good service rendered by the levees, and the additional requirements of the district at this time for the further betterment of its levees, the following is respectfully submitted:

*On Red River*—At Alexandria, the water reached a height within two feet of that of 1892, the highest water of record at that point; from Alexandria to Egg Bend, this difference gradually diminished to a stage about equal to that of 1892; from Egg Bend to David's Ferry, the high water of 1892 was gradually exceeded until at David's Ferry it was about a half a foot higher; at its mouth, Red River was somewhat lower than the high water of 1897, the highest of previous record there.

*On Bayou des Glaizes*—The high water of this year reached a height within about three-quarters of a foot of 1897, at Moreauville, to within about a quarter of a foot at Simmsport, at which point the high water of 1897 was two feet and a half higher than any water of previous record.

*On the Atchafalaya River*—The high water of this year varied from a height about a quarter of a foot below 1897, at Simmsport, to a height two feet and six-tenths higher than 1897, at Melville.

Notwithstanding this high stage of water against its long lines of levee, extending over a period of four months, the district was at no time during this period given any serious cause for apprehension for its safety from overflow.

The new work undertaken last summer on the Atchafalaya River, below Bayou Petite Prairie, as an extension to the system on the Atchafalaya River, was unfortunately unfinished at the time of the advent of the high water of this year, and much of the earthwork in position at the time was washed away, deferring the benefits to that part of the district which the completion of the work should afford.

The enlargement work undertaken by the State at Bordelonville, just before high water, was interrupted, but without loss, and the work is about to be resumed there this week.

The grades of the lines of levee in the district were shown by the high water of this year to afford good margins of safety for such waters as the district has so far experienced, except at the following named places, viz: Sunny Home and Avoyelles Dyke, on Red River, and at Green's Store, Elba and Melville, on the Atchafalaya River.

These levees should be raised and enlarged to standard grades and sections.

Much of the line on Red River is still smaller in cross-section than desirable. These points of the line should receive attention as soon as the means can be spared for that class of work.

From observations made on inspections during the period of high water, attention is called to the following places specially:

*On Bayou Rapides*—Road cuts where public road crosses levee, opposite Ball's, and where the St. Louis, Iron Mountain & Southern and the Texas & Pacific Railroads cross the public levee: defective drainage and serious seepage head of Fourth, Fifth and Sixth streets.

*On Red River*—Abuses to levee along entire city front. Erosion of river bank opposite Jackson street, and settling bank opposite Rodger's.

*Parish Farm*—Salamander holes and defective drainage.

*Hudson's*—Levee at one point battered, ragged and reduced in section by cattle crossing and herding on it. Considerable seepage and defective drainage.

*Hathorn's* (Below Cut Off Bayou)—Leak.

*Duncan's*—Levee battered, ragged and reduced in section from abuse

*Willie Wilson's*—Cherokee rose trees starting to grow over slope. Dangerous road cut.

*Jack Wilson's*—Levee around "water hole" small in section as compared with balance of line; seepage considerable; no very alarming indications during this high water, but at any much higher stage might give trouble. A banquette should be extended along this part of the levee.

*Once More*—Dangerous road cut.

*Once More to Echo*—Several dangerous pathways.

*Echo*—Banquette across bayou badly worn from use and abuse. Dangerous road cut opposite gin, and platform over levee.

*Gueringer's*—Dangerous road cut.

*Egg Bend*—Dangerous pathway and road cut.

*Bringol's, Overton's, etc.*—Several old stump holes near base of levee on land side. Should be cleaned out and filled and tamped.

*Normand's*—Large stump hole in land edge of base of levee, between Normand's and Guyot's. Levee in front of Guyot's house badly worn. Stump hole should be cleaned out, filled and tamped, and levee repaired.

*Cyrille Laborde's*—Levee badly worn in front of residence and store. Dangerous road cut back of gin—head of lane.

*Choctaw Bayou*—Banquette considerably worn, and defective ramp just below dyke. Banquette should be repaired and ramp improved.

*On Bayou des Glaizes*—A number of pathways and road cuts, and two or three pipes through levee. The exact location of these cannot at this time be stated.

*On the Atchafalaya River*—Several pathways and road cuts.

*Bayou Rouge Dyke*—Slope of banquette, on land side, sloughed to some extent during high water. Dyke should be raised and enlarged, and an additional banquette built across bayou on river side.

Along greater part of line on *all* streams, defective drainage,

The drainage work in the district was several times interrupted during the winter, on account of the extreme stages of rain water in the basins which prevailed from time to time, and hence is not as well advanced as it should otherwise be.

Fair progress is, however, again being made, and works Nos. 2, 3 and 5 should be completed during the course of this summer.

With the fact of the destruction of Work No. 1, Lamourie Dam, forming part of the project for improving drainage from Alexandria to Bayou des Glaizes, effected during the past week by parties regarding it as an obstruction to the drainage of Bayou Bœuf, you are already fully informed.

The investigation of the extent of the influence of this dam over the drainage of aByou Bœuf, requested by your Board at a former meeting has not yet been made by the Board of State Engineers. This will, however, be undertaken as soon as the more pressing levee work of the State, and local conditions on Bayou Bœuf will permit, and a special report on the subject submitted.

Respectfully,
*The Board of State Engineers,*
Per Frank M. Kerr,
*Assistant State Engineer.*

---

STATE OF LOUISIANA,
Office Board of State Engineers,
New Orleans, La., Oct. 6th, 1903.

*Hon. J. G. White, Prest. Board of Commissioners, R. R. A. and B. B. Levee District, Alexandria, La.*

Dear Sir: In compliance with the request of your Board, expressed at a meeting held on March 3rd, 1903, the Board of State Engineers has the honor to, herein, submit its opinion as to whether the congested stage of water in Bayou Bœuf, during the months of December, January and February last, "was due to the Lamourie Lam, or to the excessive rainfall," during that period. Some loss of time has been experienced in obtaining certain data, hence the late date at which this report is submitted.

The Lamourie dam was constructed by your district as a part of a plan for improving drainage from Alexandria to Bayou des Glaizes, recommended by the Board of State Engineers. The dam was completed and received on April 1st, 1901. The other parts of the plan for improving drainage, between the points named, have not yet been completed.

The closure of Bayou Lamourie, at the point of its departure from Bayou Bœuf, was recognized by the Board of State Engineers as a very desirable adjunct to the plan for improving the drainage in question, as it would separate the basin into two independent drainage channels, divide the service imposed, and materially reduce the cost of one route, without apparent prejudice or injury to the other.

In other words, it was thought well to relegate to Bayou Bœuf the duty of carrying the drainage of the territory west of it, and upon the proposed artificial and improved channels from Alexandria to Bayou des Glaizes that of disposing of the surplus rain water falling within the territory lying between Bayous Roberts and Bœuf and Red River.

The constantly increasing tendency of Bayou Lamourie to enlarge, and of Bayou Bœuf, in consequence of the large flow thereby diverted from it, to diminish in section, made it evident that, sooner or later, Bayou Lamourie would become the main artery for drainage to the territory west of Bayou Bœuf to the detriment of the territory between Bayous Roberts and Bœuf and Red River, unless the drainage channels therein proposed should be designed and constructed to meet the double servitude.

The cost of closing Bayou Lamourie dam was estimated at not exceeding $1,500, which the extension and enlargement of the proposed canals to dimensions necessary to additionally take care of the flow from Bayou Lamourie was estimated to add not less than $50,000 to the cost of the project in which its closure constituted part of the plan.

As a matter of fact, the Bayou Lamourie dam, and the siphon placed over it, as an act of grace to the people living along its banks, who feared that their supply of good water for stock and domestic purposes would be jeopardized by the closure of Bayou Lamourie, cost only $1,958.84.

The difference in cost between the two propositions thus presented, naturally resulted in the adoption of that contemplating the closure of Bayou Lamourie.

From the first day of April 1901, to the first day of December, 1902, a period of twenty months, during which Bayou Lamourie remained closed, no serious complaint at any time arose in regard to the stage of water in Bayou Bœuf. On the contrary, everyone on Bayou Bœuf seemed well satisfied with the situation, and on Bayou Lamourie conditions were regarded by all concerned as rather ideal, compared with any experience of the past.

The assertion has been made by parties, whose opposition to the dam across Bayou Lamourie afterwards developed, that the rainfall in the basin affecting Bayou Bœuf, during this period, was much below the average.

This statement is not borne out by the records of the U. S. Weather Bureau, which show that the rainfall from December 1st, 1900, to December 1st, 1901, at Alexandria and Cheneyville, was 51.91 inches and 41.70 inches, respectively, from December 1st, 1901, to December 1st, 1902, it was 49.79 inches and 43.25 inches, respectively.

The average annual rainfall at Alexandria for ten years, from 1892 to 1902, the latter inclusive, was 53.7 inches. At Cheneyville, the record for ten years is incomplete, but the average for the years 1895, 1896, 1897, 1898, 1901, and 1902, was 46.4 inches.

Deduction from this, however, is not altogether to the point. It is not the ordinary rainfall delivered in showers during the twelve months of the year that cause congestions in streams, but the continuous heavy downpours occurring during the short wet seasons peculiar to localities, at times.

The wet season in the basin in question occurs usually during the months of December, January, February and March.

The closure of Bayou Lamourie followed the wet season of December, 1900, to March 1901, inclusive, and it remained closed during and following the wet seasons of December, 1901, to March, 1902, inclusive, and December, 1902, to March, 1903, inclusive.

The records of the U. S. Weather Bureau, for Alexandria and Cheneyville, for these three wet seasons, show the following:

| ALEXANDRIA. | | | CHENEYVILLE. | | |
|---|---|---|---|---|---|
| Year. | Month. | Precipitation inches. | Year. | Month. | Precipitation inches. |
| 1900 | December | 4.81 | 1900 | December | 6.26 |
| 1901 | January | 4.74 | 1901 | January | 3.38 |
| 1901 | February | 6.77 | 1901 | February | 5.91 |
| 1901 | March | 4.10 | 1901 | March | 3.53 |
| | Total | 20.42 | | Total | 19.08 |
| 1901 | December | 8.92 | 1901 | December | 7.55 |
| 1902 | January | 1.68 | 1902 | January | 2.14 |
| 1902 | February | 4.06 | 1902 | February | 4.10 |
| 1902 | March | 2.66 | 1902 | March | 3.25 |
| | | 17.32 | | | 17.04 |
| 1902 | December | 4.37 | 1902 | December | 5.04 |
| 1903 | January | 5.61 | 1903 | January | 4.97 |
| 1903 | February | 13.87 | 1903 | February | 14.28 |
| 1903 | March | 9.10 | 1903 | March | 11.59 |
| | | 32.95 | | | 35.88 |

The precipitation for the first two wet seasons, as shown above, may be classed as about equal to the average, while that for the third was certainly abnormal.

During the first two, no ill effects were felt from the closure of Bayou Lamourie, but during the third a serious condition of affairs no doubt existed along certain parts of Bayou Bœuf.

It is, therefore, the opinion of the Board of State Engineers that the congested stage of water in Bayou Bœuf during the period referred to was due to excessive rainfall just preceding and following that period, aggravated by the closure of Bayou Lamourie.

In this connection, the Board of State Engineers would further report:

On the night of May 10th, 1903, through the lawless action of a number of unknown parties, the dam across the head of Bayou Lamourie was destroyed, and within three weeks thereafter the stage of water in Bayou Bœuf, at the head of Bayou Lamourrie, fell about 5 feet, materially reducing the extent of its encroachment upon the low lands contiguous to Bayou Bœuf, and up to this time inflicting but little damage to those on Bayou Lamourie and the basin below. The total fall before this occurred, from the highest stage of water reached in Bayou Bœuf, was about three feet.

It must, however, be borne in mind, that the rapid relief to Bayou Bœuf apparently afforded by the destruction of the Bayou Lamourie dam occurred at a time when the precipitation in the basin had been very light for fully sixty days previous to May 10th, 1903, and continued so for quite a while afterwards.

With a continuance of the conditions which existed in December, January, February, and March, preceding, the effect on Bayou Bœuf would undoubtedly have been much slower and far less pronounced.

The destruction of the dam across the head of Bayou Lamourie introduces, at a late date, a condition for which provision was not made in the project designed for improving drainage from Alexandria to Bayou des Glaizes, and leaves the latter incomplete. The question of the advisability and propriety of rebuilding the dam, or of providing for the additional servitude, which the artificial channels may be called upon to give, is, therefore, before your Board.

So far, no materially injurious effects upon the basin around Chatlin's Lake, and below, is appreciable. It is, however, probably premature to pronounce upon the question, and it may be well to await developments.

It is, therefore, recommended that any further steps in the premises be deferred until a longer period of time be permitted for a closer study of the situation and its effects.

Respectfully,
*The Board of State Engineers,*
Frank M. Kerr,
*Assistant State Engineer.*

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., Oct. 9th, 1903.

*Hon. J. G. White, Prest. of Board of Commissioners R. R. A. and B. B. Levee Dist., Alexandria, La.*

DEAR SIR: In compliance with your request of May 14th, 1903, to investigate and report upon the advisability of extending the line of improved public levee on Bayou des Glaizes, above its present terminus, that is, above the lower end of the Moreauville Lane, as petitioned for by a committee of citizens of Avoyelles Parish, the Board of State Engineers has the honor to recommend that the line be extended, for the present, to a point about one and a half miles above Moreauville.

Above this point, owing to the extension and improvement of the levee lines on Red River and the Mississippi River, and the consequent abatement of serious overflows from those sources, none of the high waters on Bayou des Glaizes since 1882 have reached elevations, except on short stretches, in 1897, much if at all above the natural surface of its banks.

Any extension above this point may, therefore, await further developments.

The number of cubic yards of earthwork required to extend this line of levee, as described, is about 50,000.

Respectfully,
*The Board of State Engineers,*
*Per* F. M. KERR,
*Assistant State Engineer.*

---

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., Oct. 2nd, 1902.

*Hon. Leon Wolff, Prest. and Members of the Board of Commissioners, Courtableau Levee District, Washington, La.*

GENTLEMEN: Pursuant to the requirements of Act No. 166 of the General Assembly of 1902, creating the Courtableau Levee District, I have the honor to inform you that the Board of State Engineers has designated me to attend this meeting of your Board.

As a preliminary report, I have the honor to submit the following:

A line of levee on the south bank of Bayou Courtableau from Port Barry to its mouth, on a basis of say 5 feet of average height, with a crown of 8 feet and slopes of 3 and 3 to 1, would take about

450,000 cubic yards of earth, and at the price at which work is now being done on both sides of the Atchafalaya River, would aggregate an average of about 20 cents per cubic yard, and cost about $90,000. A line of levee on the Atchafalaya River, on the front of your district, at a grade of about 5 feet above 1897 water, would require a levee about 7 feet in height, and contain about 250,000 cubic yards. On the same basis of price, this would cost $50,000, or the grand total necessary to complete a levee system such as is contemplated in the Act would amount to about $140,000.

The question of keeping a line of levee on the south bank of the Courtableau intact after its construction would be indeed a serious one, as the Red River, Atchafalaya and Bayou Bœuf District is steadily extending its line of levee on the Atchafalaya, and any crevasses occurring above, either on Bayou des Glaizes or on the Atchafalaya, would have the effect of piling up water on the south bank levee to a considerable height above the water level of the Atchafalaya at the mouth of the Courtableau.

In addition to this, the small territory embraced within your district would hardly justify the expenditure of so great an amount of money for the completion of an extensive levee system which would contain practically three-quarters of a million cubic yards of earthwork, at an expense of not less than $140,000.

A line of levee contemplating the closure of the Courtableau at its mouth and an extension of a system of levees to the lower line of St. Landry Parish, would only cost you one-third of the amount required for the construction of the combined system and would, in the opinion of the Board of State Engineers, give you a permanent and complete system of levees whenever the Red River, Atchafalaya and Bayou Bœuf Levee District extends its line to the mouth of the Courtableau, which project is now in the course of successful completion. Within the last two years, this district has extended its system to within about 10 miles of the Courtableau, and is still extending it. They have improved their levee system since the high water of 1897 to such an extent as to be able now to prosecute this work—which is as important to them as to you—more rapidly than ever before.

The report of H. C. Collins, U. S. Asst. Engineer, on the survey of the Courtableau in 1879 is respectfully submitted to you, also that of the same engineer in 1883-84, and of Lieut. Crosby in 1896, and of Major Adams in 1901.

You will find that after many attempts to keep open Little Devil Bar to navigation, Major Adams has finally reported that

Bayou Courtableau is only navigable in high water. The same thing might be said of any road or trail cut through the woods and the stumps and trees removed. Therefore, after the expenditure of $57,800 by the Government, at the mouth of Bayou Courtableau, to remove the bar and improve navigation, it has practically abandoned the idea; and as a matter of fact, notwithstanding the expenditure during a period of 8 years, of something like $57,800, the bar at the mouth of Bayou Courtableau has extended up the bayou from a distance of 6,200 feet in 1879 (See H. C. Collin's report) to 14,800 feet in 1896 (See Lieut. Crosby's report) and in 1900 to 16,000 feet, as was observed by Mr. Kerr and myself on an inspection in October, 1900. Throughout the whole distance of this bar there is such a collection of snags, driftwood, etc., that it is not practical to open it again for navigation.

A large part of the richest portion of the Parish of St. Landry is now practically unprotected from overflow. A judicious expenditure of your revenues and the united efforts of yourselves, the Commissioner from St. Landry to the Red River, Atchafalaya and Bayou Bœuf Levee District, and co-operation with the citizens of St. Martin Parish, in urging the Atchafalaya Basin Levee District to join you in the extension of your levee system, would result in a continuous line of levees from Moreauville, on Bayou des Glaizes, to Butte la Rose, on the Atchafalaya, and bringing into cultivation a vast area of exceedingly valuable lands.

The water of the Courtableau could be utilized by the citizens living along Bayou Teche for a constant supply of pure, fresh water, and for irrigation purposes, throughout its length; whereas, as the matter now stands, the alluvial parts of your Parish are unprotected from overflow, the Courtableau is not navigable, and the Teche is not now sufficiently supplied with fresh water.

We would, therefore, suggest that you take some steps to have the Parishes of Iberia, St. Martin and St. Mary pay the expenses of dredging Bayou Teche from its head to a point where the bottom would be sufficiently low to carry off the surplus waters of the Courtableau.

We would recommend that your Board expend whatever funds may be available in the construction of a levee line on the Atchafalaya River.

Very truly yours,

*For the Board of State Engineers,*
M. P. Robertson,
*Assistant State Engineer.*

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, May 5th, 1902.

*To His Excellency, W. W. Heard, Governor of Louisiana. Baton Rouge.*

SIR: In accordance with your request, I have the honor to state that the necessary surveys for the improvement of the State House grounds at Baton Rouge have been made under the direction of this Board, and a plan is submitted, herewith, for your consideration.

In order to study the different maps submitted to you, I would respectfully suggest that you examine each detail of the different plates. We have tried to conform these plans as nearly as possible to the present existing condition of the grounds, with a due regard for their drainage, the trees that are now growing, and the general principle of terracing which now exists, so as not to destroy the terracing effect, Baton Rouge being the first hills jutting out on the river.

The three principles which we have made paramount have been: first, the preservation of the terraces; second, the conformation of the ground to the established city grades of Baton Rouge; and third, the planting of palms and flowers in the low ground on either side of the State House.

To have changed the plan of improvement of the pleateau upon which the State House is now situated, would have necessitated the removal of many valuable trees and not given the proper recompense in flowers and palms; but we have included in this plan Schillinger sidewalks in place of those that now exist in gravel and brick.

Plate No. 1 shows topographically and by elevations the present condition of the grounds.

Plate No. 2. The proposed improvements.

Plate No. 3. By sections and profiles the proposed new grades for banquettes and grounds.

For convenience in studying the plan of improvement, we have divided each special feature of the work under its own heading, as follows:

*Earthwork*—Under the head of earthwork, we have attempted, without detracting from the appearance of the ground, to get as much material as possible for the filling in of the low ground between Natchez street and the terrace, and in order to do this it has been necessary to extend the terrace which now exists on the America street, or south side of the State House to St. Philip street, and to lower the grade at the foot of the present existing terrace from its southwest corner to St. Philip street, as will be shown fully on Plate No. 2. We have been able to gain about 2,000 cubic yards of material from this source, but will still have to haul about 850 cubic yards. In detail, we would say that a reasonable cost for the excavation where the material may be obtained from the grounds will be about 25 cents per cubic yard, or an aggregate of $500.00. The hauling of the 850 cubic yards to be obtained outside of the grounds will cost about $650.00.

*Retaining Walls.*—There will have to be constructed retaining walls from the natural surface of the ground to 6 inches above sidewalk grade for the fence, which will aggregate about 70,000 bricks at $14.00 per thousand laid, making a cost of say, $1,000; sidewalks, retaining walls at curbs, aggregating about 35,000 bricks, at $14.00 per thousand laid, making a cost of say, $500.00.

*Schillinger*—For Schillinger sidewalks on the banquetes, a 9-foot sidewalk on St. Philip, America and Natchez streets, aggregating about 534 square yards, at $1.50 per square yard, making a cost of say, $1,500; and a 12-foot banquette on North Boulevard street, 220 feet in length, aggregating 285 square yards, at $1.50 per square yard, making a cost of say, $500. For the walks in the State House grounds, as per Plate No. 2, 1,600 square yards, at $1.50 per square yard, making a cost of say, $2,400.

*Drainage*—For vitrified pipes for drainage of terraces and grounds, 2,000 linear feet, at 25 cents per foot, costing $500.00. For 40 gratings or catch basins, at $5.00 each, costing $200.00.

*Fences*—For removing, replacing and recasting 1,121 feet of fence, $2,000. There seems to be considerable doubt as to whether it is feasible to remove and replace the fence now standing on the grounds on North Boulevard and America street to any additional grade or lesser grade, without recasting the pickets. There is in your possession, or has been made by Major R. L. Pruyn, a plan showing a remodeling of the fence with the lower stringer alone remaining as it is now, and the balance of the fence removed. This plan, on his estimate, would cost about $1.40 per foot. Several experts have been called upon by this Board to make an examination as to this question, and have reported that there would be a space of at least one-fourth of an inch showing above the rail at the bottom of the pickets, which would be evidently unsightly. It might be possible, however, that this defect would not show above the line of the railing, as there is considerable play in the post, and the grade for the most part seems to have been set in the railing rather than in the pickets.

*Painting*—For painting of fence, $500.

*Gardening*—Including furnishing of the necessary palms and flowers, as per plan, $700.00.

For superintendence and contingencies, $1,000.

### RECAPITULATION.

| | | |
|---|---|---|
| Earthwork— | | |
| Cubic yards of cut, fill and hauling | | $ 1,150.00 |
| Retaining Walls— | | |
| At fence | $1,000 | |
| At curb | 500 | 1,500.00 |
| Schillinger— | | |
| 9-foot sidewalks | 1,500 | |
| 12-foot sidewalks | 500 | |
| Walks | 2,400 | 4,400.00 |
| Drainage— | | |
| Vitrified pipes, catch basins | | 700.00 |
| Fences— | | |
| Removing, replacing and recasting of | 2,000 | |
| Painting of | 500 | 2,500.00 |
| Gardening— | | |
| Furnishing, planting and modeling of garden | | 700.00 |
| Superintendence and contingencies | | 1,000.00 |
| Total | | $11,950.00 |

Very respectfully,
*The Board of State Engineers,*
*Per* M. P. ROBERTSON,
*Assistant State Engineer.*

---

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., May 13th, 1903.

*Governor W. W. Heard, Baton Rouge, La.*

DEAR SIR: As understood over the telephone last Sunday, I promptly went to Alexandria, returning here yesterday, after an extended conference with Hon. J. G. White, President of the Board of Commissioners of the Red River, Atchafalaya and Bayou Bœuf Levee District, in regard to the district dam across the head of Bayou Lamourie, in Rapides Parish, the siphon over the dam, and the recent destruction of the same.

This dam was constructed by the district as part of the plan for improving drainage from Alexandria to Bayou des Glaizes, recommended by the Board of State Engineers. It was completed in April, 1901, at a cost of $1,347.84.

Serious opposition to the closure of the Bayou had been made by a number of the residents on Bayou Lamourie, claiming that it would cut off their necessary supply of water for family use, watering stock, etc. To satisfy this, the district, at a further expense of about $1,000, placed an 18-inch siphon, fully equipped for service, over the dam.

This arrangement appeared at the time perfectly satisfactory to all parties concerned, the residents of Bayou Bœuf, particularly those below the head of Bayou Lamourie, having always greatly favored the project, and the anxieties of those on Bayou Lamourie having been allayed by the successful operation of the siphon.

The Board of State Engineers was satisfied that the closure of Bayou Lamourie would prove a most valuable and comparatively inexpensive adjunct to the project for improving drainage proposed, which has since been fully demonstrated, and did not believe that any unfavorable conditions would under normal conditions result in Bayou Bœuf.

For a period of nearly two years the situation in all directions has been eminently satisfactory, but, as the result of a phenomenally wet period of about four months duration, a congested state of affairs occurred this spring in Bayou Bœuf, more particularly above than below the dam, and considerable territory which it is claimed had enjoyed immunity from serious overflow from rain water for a great number of years suffered in consequence.

The conclusion was immediately arrived at by those who were thus affected that the prime cause of this overflow was due to the closure of Bayou Lamourie, and the Levee Board was appealed to for relief.

The Board of Commissioners promptly agreed to have the necessary investigations made to determine the facts in the premises as soon as local conditions would permit.

Opportunity to make this investigation has not yet been given.

In the meantime, as the water in Bayou Bœuf declined very slowly and the overflowed area was apparently receiving little or no relief, the demolition of the dam at Bayou Lamourie at the hands of those who had grown impatient over the situation resulted, and on Monday last Bayou Lamourie was running bank full.

The Board of State Engineers does not believe that the closure of Bayou Lamourie was altogether responsible for this overflow, but that under similar conditions, practically as serious and general an overflow from rain water is likely to occur on Bayou Bœuf at any time, whether Bayou Lamourie be opened or closed, until such time as Bayou Bœuf itself may be properly cleared and improved to its former carrying capacity, which has gradually become impaired by the diversion of its waters through Bayou Lamourie in the past, and its choking up with silt, from numerous drains into it, timber growth, dams, low water bridges, fords, the encroachment upon its banks for habitation, and for stock and hog pens, etc.

The opening up of Bayou Lamourie at this time, after quite an extended dry period, with little or no supply to Bayou Bœuf from recent rainfall, will demonstrate little or nothing in regard to what the situation might be under extreme weather conditions as existed in December, January, February and March last.

The investigation asked for will still be made by this Department, as soon as the opportunity will permit, and, as I understand it, the Levee Board will be governed by the report of the Board of State Engineers, as to its further action in regard to the restoration of the dam and siphon.

I shall be pleased, if you desire it, to keep you further advised of the situation as it develops.

I return to Alexandria to-night.

Your very truly,
Frank M. Kerr,
*Assistant State Engineer.*

---

STATE OF LOUISIANA,
Office Board of State Engineers,
New Orleans, La., July 2nd, 1902.

*To His Excellency, W. W. Heard, Governor of Louisiana, Baton Rouge, La.*

Sir: I respectfully report for your Excellency's information that in accordance with directions, I attended upon the Mississippi River Commission at its recent meeting in St. Louis.

The session began June 23rd, and continued four days. The first day's session was public; and the Commission listened to the remarks and statements from twenty or more persons representing various river interests—among them Congressman Ransdell, President Barham, of the Tensas Basin Levee Board, and President McClellan, of the Fifth Louisiana Levee Board.

The "Rivers and Harbors Act" (Public Act of Congress No. 154, approved June 13, 1902) appropriates $2,200,000 for improving the Mississippi River from the head of the Passes to the mouth of the Ohio, and authorizes additional contracts for $6,000,000, at the rate of $2,000,000 per annum, for three years ending June 30, 1906. Out of amounts thus appropriated and authorized, expenditures during the two years, are authorized for New Orleans, Natchez and Vidalia and Memphis harbors, and for rectification of Red and Atchafalaya Rivers, aggregating $200,000. Also from the amounts appropriated and authorized expenditures during the four years are authorized as follows: for Greenville, Miss., $50,000; Helena, Ark., $20,000; Caruthersville, Mo., $20,000; and New Madrid, Mo., $20,000; aggregating $110,000.

The total appropriation and authorized expenditure for four years ending June 30, 1906, being $8,200,000, out of which specific appropriations are made aggregating $310,000, leaves for distribution or allotment to the several clases of work $7,890,000.

For two years the amount appropriated and authorized is $4,200,000, out of which $200,000 is specifically appropriated, and (presumably) one-half of the $110,000 appropriated and authorized for four years, so that the amount available for two years is $3,945,000.

Out of this amount the Mississippi River Commission allotted for levees $1,000,000 per annum for two years—that is, $2,000,000, or, say, 57 per cent of the total amount available.

The distribution of this allotment among the several levee districts was as follows:

| Name of Levee District. | 1902-3. | 1903-4. | 2 years. | |
|---|---|---|---|---|
| Upper St. Francis, Mo........ | $ | $ 20,000 | $ 20,000 | |
| Reelfoot, Ky. and Tenn...... | 20,000 | 20,000 | 40,000 | |
| Lower St. Francis, Ark...... | 125,000 | 125,000 | 250,000 | |
| White River, Ark........... | 90,000 | 90,000 | 180,000 | |
| Upper Yazoo, Miss.......... | 70,000 | 70,000 | 140,000 | |
| Lower Yazoo, Miss.......... | 291,000 | 291,000 | 582,000 | |
| Upper Tensas, Ark. and La... | 112,500 | 112,500 | 225,000 | $788,000 |
| Lower Tensas, La........... | 110,000 | 110,000 | 220,000 | |
| Atchafalaya, La............ | 40,000 | 40,000 | 80,000 | |
| Lafourche, La. ............. | 20,000 | 20,000 | 40,000 | |
| Barataria, La. ............. | 10,000 | 10,000 | 20,000 | |
| Pontchartrain, La. ......... | 101,500 | 81,500 | 183,000 | |
| Lake Borgne, La. ........... | 10,000 | 10,000 | 20,000 | |
| | $1,000,000 | $1,000,000 | $2,000,000 | |

The allotment for levees in which Louisiana is directly interested amount to $788,000, that is, about 39.4 per cent of the total allotment for levees.

The Commission also allotted $245,000 for bank revetment and harbor work in which Louisiana is interested, as follows: at Bondurant, La., $10,000; at Kempe, La., $60,000; for Natchez, and Vidalia Harbors, Miss., and La., $65,000; for rectification of Red and Atchafalaya Rivers, La., $15,000, and for New Orleans Harbor, $95,000.

The State of Louisiana, I think, has good reason to be pleased with the action of the Mississippi River Commission in its allotment of the funds for river improvement placed at its disposal.

Very respectfully,
HENRY B. RICHARDSON,
*Chief State Engineer*

---

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., May 19th, 1903.

*To the Mississippi River Commission, through General O. H. Ernst, Corps of Engineers, U. S. Army, President.*

GENTLEMEN: In compliance with the request contained in your resolution, transmitted in a letter from the President of the Commission, of date April 6th, 1903, I have the honor to submit the following statement relative to the "High Water of 1903, and condition and needs of the Levees" on the Mississippi River, protecting the alluvial lands of the State of Louisiana:

### INTRODUCTORY STATEMENT.

The levee system directly protecting the State of Louisiana against overflow from the Mississippi River extends on the right bank from "Costello's Gin," on Amos Bayou, Desha County, Ark., to Bougere Landing, about 26 miles above the mouth of Old River—usually known as the mouth of Red River—a distance by river of say, 333 miles; and from Barbre's Landing on Old River, at the head of the Atchafalaya, to the Jump, 10 miles above the head of the Passes, a distance by river of about 302 miles.

At Donaldsonville, 182 miles below the so-called mouth of Red River, this line is interrupted by the outlet of Bayou Lafourche, which is leveed on both sides for some 80 miles below. On the left bank the levee system extends from Baton Rouge to Bayou Goubray, below Fort St. Philip, a distance by river of about 207 miles.

Between 1886 and 1902, the State Legislature has created fifteen Levee Districts, each having a Board of Commissioners invested with corporate powers to provide and administer revenues for the construction and maintenance of levees. The line above referred to comprises the levees along the Mississippi River in eight of these districts, viz: On the right bank—in the Fifth Louisiana Levee District, from the Arkansas line to near the mouth of Red River, about 218 miles; in the Atchafalaya Basin Levee District, from Barbres Landing on Old River to the head of Bayou Lafourche, at Donaldsonville, about 128 miles; in the Lafourche Basin Levee District—except the City of New Orleans—from the head of Bayou Lafourche to Riceland, about 120 miles; and in the Buras Levee District, from Riceland to the Jump, about 34 miles. The Tensas Basin Levee District, lying in the interior between Bayou Macon and the Ouachita River, aids in the construction and maintenance of levees on the right bank of the Mississippi River in Desha and Chicot Counties, Arkansas. On the left bank: the Pontchartrain Levee District has a levee line extending from Baton Rouge to New Orleans, about 126 miles; the Lake Borgne Levee District, a line from New Orleans to Bohemia, about 48 miles; and the Grand Prairie Levee District, a line from Bohemia to Fort St. Philip, about 26 miles; while the Orleans Levee District has levees on both banks of the Mississippi coterminus with the limits of the City of New Orleans, about 13 miles on each side.

The levee systems of these districts, with the 85 miles of levee in Arkansas upon which Louisiana is directly dependent, have an aggregate length on the Mississippi River of about 811 miles; while the levees on interior streams—the lower Red, the Atchafalaya, the des Glaizes and the Lafourche—which are more or less brought into service by flood stages of the Mississippi, sum up a length of over 260 miles; thus making the total length of levee line directly protecting Louisiana against overflow from the Mississippi River and subjected to strain by the high water of 1903, exceed 1,070 miles.

## THE HIGH WATER OF 1903.

The high water of 1903, as affecting the levees of Louisiana, may be said to have begun in December, 1902, although the stages reached at that time in the Mississippi River did no harm except to interrupt some of the work of levee enlargement then in progress. On Red River, in the northern part of the State, the water was at some points higher than ever before recorded. One crevasse occurred about 50 miles above Shreveport, while the enormous erosion of the river banks—in some places on both sides at the same time—made a vast amount of work necessary on hastily built loops around the places breached or threatened by the rapid caving.

But the December floods had generally declined by the end of January, and it was not until the heavy rains which occurred throughout the valleys of the tributaries in the first two weeks of February, that the probability of a dangerously high water in the Mississippi became apparent. After about the fifth of February, the rivers in Louisiana rose continuously, and, a part of the time, rapidly, so that within the next two weeks the water was generally well against the levees in all parts of the State. On the lower Mississippi, at Fort Jackson, the gauge read the same as the highest in 1897 (7.2 feet) as early as March 5th, and by March 21st, it reached 0.8 feet; that is, 0.8 of a foot higher than any stage previously recorded. Near the upper end of the State—at Lake Providence—the high water mark of 1897 (44.54 feet on the gauge) was passed this year on March 19th, and on March 27th, the gauge reading was 46.45 feet, or 1.9 feet higher than the highest of previous record.

At Vicksburg, 57 miles below Lake Providence, the highest stage this year was 0.7 foot below the highest of 1897; while from St. Joseph to Natchez the water was from 0.2 to 0.6 of a foot higher than in 1897. From Red River Landing to College Point the highest stage of 1903 was from 0.2 to 0.6 lower than the highest of 1897; but at New Orleans and at Fort Jackson it was about 0.8 of a foot higher than in 1897, and at intermediate points higher still.

The lower part of the river reached proportionately high stages this year sooner than similar stages were reached above. For instance, at Fort Jackson a half stage appeared four days earlier than at Baton Rouge, 206 miles above; a three-quarter stage, nine days earlier, and the highest, seventeen days earlier. The flood of 1897, also exhibited the same sort of prematurity in its stages below, though in the floods of 1898, 1899 and 1900 such marked advance of dates was not apparent.

The floods of 1897 and 1903 were both preceded by three or four years of only moderate high water.

These facts may further corroborate the conclusions relative to the increased carrying capacity of the river between Carrollton and Red River Landing, stated in the paper by Major Derby, published as Appendix I of your Annual Report of 1900. They may also indicate that the maintenance of such increased capacity is, as might be expected, dependent upon the passage of the larger floods, and that even the largest floods require time for the accomplishment of their work.

The effect of crevasses in limiting flood heights in Louisiana this year appears to have been insignificant. The crest of the flood wave coming down the river must have nearly reached the upper line of the State when the breaks in levees on the opposite side below Greenville occurred. A further rise of three or four-tenths of a foot, or say 47 feet on the gauge, was the most that could have been expected at Lake Providence. The largest crevasse of the season, at Hollybrook, five miles below, occurred when the river had already fallen over two feet at Lake Providence and a foot and a quarter at Vicksburg. It, of course, had no influence upon the maximum stage in that locality. While the return to the river of flood water from these crevasses at Vicksburg and the mouth of Red River, evidently prolonged the high stages at those points, it apparently failed to produce an increase of height at either place.

The only other important crevasse on the Mississippi River in Louisiana, at Hymelia, 36 miles above New Orleans, was so constantly worked upon in the efforts made for its closure that its discharge was never sufficient to appreciably affect the flood stage, which had practically culminated at the time the break occurrred.

The water in Bayou Lafourche, as usual, rose to excessive heights. At some points from 30 to 50 miles below its head, the stage was at least a foot higher than in 1897. Three breaks occurred in the levees on its right bank. In the Atchafalaya, at Melville, about 30 miles below its head, the stage was 2.6 feet higher than in 1897. This extreme high water in both these streams—and also, to a large extent, that in Bayou des Glaizes and the lower Red—was, of course, due to the high stage of the Mississippi.

### Condition of the Levees.

The continued work on the levees of Louisiana during the past twenty years by the Levee Districts, the State and the United States has resulted in a constant improvement of their height, width and location, so that the flood of 1903 found them better in grade, section and apparent strength than they ever were before. At the same time there remained in most of the districts many stretches of levee with little or no margin of height above the flood level of 1897, and with corresponding deficiency in width and mass. In the Pontchartrain Levee District alone it was estimated that as much as 21 miles, or one-sixth of its levee line stood less than one foot above the high water of 1897; while in other districts, although the proportion of low levees was nowhere as great, there was some 12 miles more, making an aggregate of say 33 miles.

When it became evident that the rivers in Louisiana might rise to a height equal to or above the high water mark of 1897, the Levee Commissioners of the several districts and your executive officers began the work of raising the crowns of the lowest levees. This was generally done with a small bank of earth revetted on the water side with one or two lines of inch plank, or, sometimes, with several tiers of earth-filled sacks.

The total length of this class of work on the Mississippi River in Louisiana was about 71 miles, some 24 miles of which proved actually necessary to prevent water running over the tops of the levees, and a much greater length to prevent waves washing through them where the margin above water was only a few inches.

In the upper part of the State, the Commissioners of the Fifth Louisiana Levee District found it necessary, on account of the unprecedentedly high stage of the river, to raise the levee south of the Arkansas line from one to two feet for a distance of 17 miles; and the rise of the river was so rapid that there was not time to obtain earth otherwise than by cutting away a part of the crown and taking a slice from the upper portion of the rear slope of the levee. The water stood against this emergency work, overtopping the crown of the original levee in some places as much as two feet. In the lower part of the State also—especially in the Buras and Grand Prairie Levee Districts—the water overtopped the levees for a length aggregating at least five miles, and, although the levees there were raised for a much greater length, it was found impossible in the Grand Prairie District to prevent this temporary work from being washed away in some places by the waves, which were mostly caused by the passing of large ocean steamers.

Inspectors, watchmen and guards were generally placed on the levees by the Commissioners in all the districts of the State; the Tensas Basin Levee District sending forty guards outside the State to Desha County, Ark.

You executive officers stationed boats loaded with tools, sacks, lumber, etc., at convenient intervals along the river, and some of the levee districts kept trains of cars similarly laden, all of which were constantly in readiness to move promptly to any point where they were needed.

The expenses incurred in this class of work by the several levee districts of the State—not including the cost of closing and attempting to close crevasses—amount to over $185,000.

Before the water came very high against the levees special attention had been generally given to the drainage of the roads and land adjacent to the levees; and wherever drains were open and made effective, the firmer, dryer and less leaky condition of the levees was in marked contrast with their condition in places where drainage was deficient. During the higher stages of the flood numerous holes (usually ascribed to crawfish) developed at and near the base of the levees, and many places on the slopes became soft and, sometimes, began to slough down their sides. It was noticeable that such holes and sloughs were usually at places where the drainage was least efficient or most recently made.

Holes discharging muddy water were generally treated by placing earth, or driving sheet piles, on the river side of the levee at or beyond the base, and usually with success. In some cases "run-arounds" of earth or walls of sack were used to surround the outlet of the holes on the land side. Sloughing places were mostly treated in a similar manner—that is, with earth placed on the river side slope, with good results—but when so extensive as to threaten encroachment upon the crown of the levee, they were often covered with brush, cinders, or other porous material, and loaded down with earth in sacks, and sometimes backed up with a wooden bulkhead at the toe of the sliding mass. It is not certain, however, that the same amount of work and material applied, in such cases, to the river side of the levee would fail to prove equally as effective.

Several breaks occurred in the Grand Prairie Levee District (about 1018, 1025 and 1040 miles below Cairo) due to the water overtopping the small levees there, and despite the strenuous efforts made to build them higher as the water rose. Their aggregate width is three-quarters of a mile or more.

The caving of the bank carried away the levee at Magnolia (1012 miles below Cairo) on April 5th, when the water was near its highest stage and close to the top. The levee was about 8 feet high and the cave took in a part of the land side base for a length of about 230 feet, so that the water at once ran over the remaining part of the levee some two feet deep, and later, five or six feet deep. By prompt action the planters in the immediate vicinity succeeded in securely closing the crevasse within the next four days, and before serious damage was caused by overflow. The cost of the work is reported as about $7,000. At several other points crevasses were barely prevented by similar prompt attention; notably at Waterloo (876 miles below Cairo) in the Pontchartrain Levee District, where a large hole under the levee suddenly developed on April 13th, which was only stopped by a wall of some 12,000 sacks of earth surrounding its outlet, and a crib-work and bulkhead afterwards built on the river side.

But the two most important crevasses in Louisiana were at Hymelia (928 miles below Cairo) in the Lafourche Basin Levee District, and at Hollybrook (546 miles below Cairo) in the Fifth Louisiana Levee District, both of which, on account of location, height of levee and stage of river, threatened serious inundation of the levee districts in which they occurred.

The Hymelia crevasse had its origin in a hole at the base of the levee discovered late at night on March 26th, when it was described as "about as big as a hogshead." Before anything could be done to stop it, the crown of the levee fell in, and the break was rapidly enlarged. The levee was built in 1891 and enlarged in 1896. It was located on a "batture" in front of the old levee line, the remains of which still stood some 2,400 feet in the rear. There was a considerable growth of willows on the foreshore which extended 1,000 feet or more in front. It was 11 feet high, and a crown 8 feet wide, with side slopes of 3 to 1, was well grassed, and had a plank revetment in front, and is said to have been well drained. The guards who were patrolling the levee are reported to have passed the site of the break but a few hours previous, finding everything apparently sound and safe—the water about 2½ feet below the top.

No defect was known or suspected in the construction, and none had appeared in adjacent parts of the line.

Although the water against the levee was deeper than that in which it has usually been found that successful work for closing crevasses can be done, it was shallower on the willow batture in front, and thus presented a more favorable opportunity for the attempt than otherwise. The remains of the old levee in the rear also, to some extent, reduced the probable head to be encountered.

The District Levee Board, the railroads and the planters, therefore, began work next morning with large forces and ample materials, and continued vigorous efforts to close the break for over a month. The cost of the work to all parties contributing is reported as at least $130,000.

The usual method was adopted—that is, parallel lines of scantling driven as deep as practicable at sufficiently close intervals to prevent sacks of earth from washing through (commonly known as "cribbing")—which appears to be the only method that has often proved successful. Sheet piling was also used later, but the bottom scoured too rapidly whenever the opening became narrower than the gap in the levee, to make complete closure feasible, although at one time the cribbing had entirely surrounded the break. The final width of the crevasse in the line of the levee was about 750 feet; its size and discharge having, probably, been decidedly limited by the constant work done in the endeavor to close it.

The Hollybrook crevasse also had its beginning in a small hole that appeared on the side of the levee four or five feet below the top. It was first seen early in the morning of April 3d, by a colored laborer living close by, who failed to attempt stopping it, but instead, ran in panic to save his property and alarm his neighbors. The circumstances as regards previous inspection, the inability of those who first reached the place to close the hole, the size it then had, with the falling in of the crown and the rapid enlargement, were almost an exact repetition of those at Hymelia. The original holes at both places appear most likely to have been made by some burrowing animals, and the only difference, except as to size at the time of discovery, was in position. The levee where the crevasse started was about 17 feet high, with side slopes of 3 to 1, crown 8 feet wide, and a "banquette" 20 feet wide at 10 feet below the top. It was built in 1877 and enlarged in 1894 and again in 1899. It was well sodded and appeared in excellent condition, the water at the time of the break was 4 feet below the top, having fallen about 2 feet since the highest stage, five days previous. There was a wooded foreshore nearly a half mile wide in front of the levee, and cultivated land in the rear. No attempt was made to close the crevasse, though a line of trees was cut down and secured around it with a view to reducing the flow. It enlarged rapidly for about ten days and finally became over 3,000 feet wide.

## EXTENT OF OVERFLOW.

Exact information as to the area and limits of overflow is not readily obtainable. It is probable that there are many ridges within the general boundaries of the flooded regions which remained above water, and on the other hand, possible that some small areas of overflow lie outside them. But the following statement, based on special reconnaissance and inquiry, and in part upon reports from Parish Assessors, are believed to be approximately correct.

The area overflowed by the small crevasses in the Grand Prairie District is mostly sea marsh and does not exceed 16 square miles, about 1,600 acres (2½ square miles) of which is adapted to rice culture, thought but little, if any, of the land had been prepared for sowing. The greatest damage resulting from this overflow was to the oyster beds, which had been extensively planted and were becoming the object of a profitable and increasing industry.

The two larger crevasses in Louisiana, at Hymelia and Hollybrook caused much less overflow and injury than would generally have been predicted from comparison with some of the larger breaks in levees near the same localities in previous years—for instance, with the Davis crevasse of 1884, 12 miles below Hymelia, and the Wyly crevasse of 1893, three miles above Hollybrook.

The water from Hymelia crevasse mostly ran back towards Lake des Allemands, spreading out only about two miles wide on the immediate river front, and overflowing say 11,000 acres of the cultivated plantations between the lake and the river. The water crossed the track of the Texas & Pacific Railway, and partially interrupted its operation for about ten days.

Lake des Allemands was raised about three feet above its usual level and Lakes Ouacha and Cataouatche somewhat less. The total area within the limits of overflow was about 1,320 square miles, at least 1,300 square miles of which was sea marsh, low swamp land, and normal water surface. The area of cultivated land laid under water by the Hymelia crevasse was not over 12,500 acres, say 19.2 square miles.

The overflow from Hollybrook crevasse covered over two-thirds of the area of the two upper parishes of the Fifth Louisiana Levee District; that is, East Carroll and Madison. In the latter parish the overflow was confined to the western part, leaving the cultivated lands on the river front untouched. The course of the water was towards the Tensas River and Bayou Macon, and thence down those streams and through the low wooded lands adjacent, and across them into Franklin and Catahoula Parishes, passing between the high lands of Sicily Island on the west and the banks of the Tensas River on the east, and mingling in Black River some miles below the junction of the Ouachita and the Tensas, with the back water from Red River and Bougere.

The total area of overflow directly due to the Hollybrook crevasse is estimated at 930 square miles, about 46,200 acres (say 72 square miles) of which is cultivable land, in the Fifth Louisiana Levee District.

The aggregate area of overflow due to crevasse in the levees of the Mississippi River in Louisiana is thus estimated at about 2,266 square miles, of which nearly 93 square miles, or say, 59,300 acres, is cultivable land.

The total area of cultivated land in the seventeen parishes entirely included in the levee districts (except the Orleans District) bordering the Mississippi River was in 1901, according to the report of the State Auditor, 770,114 acres. The cultivated acrea has certainly been increased since that date; but leaving this out of the account, and also, because it cannot be dfinitely stated, leaving out the area included in the four parishes, parts of which only are contained in these levee districts—which area, by the way, was not overflowed in 1903—there was less than 8 per cent. of the cultivable land in these parishes overflowed by crevasses. If the actual figures were available the area overflowed would probably prove to be less than 7 per cent. That is to say, that at least 92 per cent., and probably a considerably larger proportion of the cultivable lands in the levee district bordering the Mississippi River was protected against overflow from vrevasses by the levee system—every acre of which must have been inundated had there been no levees.

The greatest overflow in Louisiana, however, was in the lower end of the Tensas Basin, and came principally from "back water" around the lower end of the levee system, near Bourgere Landing, and fro mthe high water in the Red, Black and Ouachita Rivers.

For the past thirty-five years, or more, there had been no attempt until last year to restore the line of public levees, which, at an earlier date, had been built and maintained below Bougere Landing (26 miles above the mouth of Red River), so that whenever the Mississippi rose above bank-full stage below Bougere, more or less overflow took place, adding to the water that backed up to its natural level through the mouth of the Red River.

But in 1902 a branch of the Texas & Pacific Railway was under construction along the right bank of the Mississippi, and its embankment was built to a higher grade than that of other parts of its line—that is, to near the level of high water in 1897—along the lowest stretch of the river bank, for several miles immediately below Bougere; and the Commissioners of the Fifth Louisiana Levee District extended their levee line some two and a half miles to a junction with the railroad embankment. It was hoped and expected that within another year or two the railroad bank would be enlarged so as to make it high and strong enough to serve as a levee, and that the levee line south of the high grade railroad bank could be extended so as to bring the terminus of the levee system down to within a few miles of the mouth of Red River. It was also thought possible that, meanwhile, the floods might not be greater than could be held by the railroad embankment.

But, as it proved, the flood of this year came high enough to breach the railroad bank by March 14th, at which date the back water from the Red and the Ouachita Rivers was still about seven feet lower there than in the Mississippi. The breach in the railroad bank rapidly widened and extended into the levee just built above, carrying away nearly two miles of it, and leaving the situation practically the same as it had been for many years previous.

The resulting overflow covered over 80 per cent. of Concordia Parish and a large area in Catahoula and Avoyelles Parishes before any water from the Hollybrook crevasse appeared there. In fact, the water from Hollybrook did not touch the upper part of Concordia Parish at all, and before it appeared in Catahoula the back water was already declining. The total area in these parishes overflowed by this back water from below Bougere was about 1,325 square miles, about 30,000 acres of which, in Concordia Parish, was cultivable land.

It is to be noted that had there been levees down to near the mouth of Red River, the back water would have been six or seven feet lower north of Bougere, and probably no cultivated land would have been flooded in Concordia or Catahoula.

## NEEDS OF THE LEVEES.

The greatest need of the levees protecting Louisiana—as of most of the other levee systems—is enlargement. You already have estimates of what is needed for this purpose.

Notwithstanding the unprecedented height reached by the river this year at both the upper and lower ends of the State, there is nothing as yet apparent to indicate that the provisional grades for levees adopted by you in 1898 (shown in Plate B of your report of 1899) will prove insufficient. Had the levees been completed to "Commission Grade" they would have shown a margin above the water of 1903 of two to five feet everywhere from the Forts to the mouth of Red River, and thence to the head of the system in Arkansas, of not less than three and one-half feet.

The form and proportions of the "standard section" recommended by your district officers November 11th, 1899, still appears well devised and adequate for actual needs. Should means ever become available to make the levees wider in base and crown than this standard, it should, of course, give them an increased factor of safety, and such additional strength will doubtlessly be demanded at some future time when the sufficiency of their height has been proved by long experience.

The levees protecting Louisiana also need extension. To prevent overflow around the head of the system on Amos Bayou, the line should either be carried further up the bayou, or else the Arkansas River levees should be extended further down. The extension of the levee at the foot of the Lower Tensas District, is also necessary to limit the wide spread flooding caused by water backing around the present lower end of the system near Bougere Landing. The levee line should also be extended across the head of Bayou Lafourche so as to do away with the necessity of levees on its banks. An extension is also needed on the left bank below Fort St. Philip, at least as far as Baptiste Collet Canal.

The more immediate needs are for certain large levees necessary for their continuity, which are needed on account of caving banks and crevasses, and for the raising and enlargement of the lower part of the existing line, especially where the late flood heights were in excess of previous records.

That part of the Upper Tensas District in Louisiana furnished the most notable example of both these immediate needs. A levee to close the Hollybrook crevasse will probably require 400,000 cubic yards of earthwork, and two other new levees each requiring nearly as much will almost certainly be required before another high water season, on account of caving banks; one at Mascot (576 miles below Cairo), and another at Biggs (604 miles below Cairo); while the enlargement of the levees south of the

Arkansas line shown to be necessary by the extreme high water this year is estimated to require 900,000 cubic yards of earthwork.

The levees of the Mississippi River are still incomplete in all the State and districts. They have thus far served more efficiently than could have been expected in protecting the Alluvial valley from overflow, and they give increasing promise of entire success when they are all built up to the standards of grade and section designed for them. But much remains to be done before these standards can be reached; and, meanwhile, every district has its annual battle behind imperfect defenses to hold back the floods poured down from over a million square miles of watershed.

In some States—and notably in Louisiana—it is physically impossible to build any levees within their own territory which can protect them against overflow by water escaping from the river in neighboring States.

And so, a need for the levees more important for their complete success than any other, is that the United States take charge of their construction and maintenance. This is contemplated in Article 240 of the Constitution of Louisiana and earnestly desired by her people.

Respectfully submitted.

HENRY B. RICHARDSON,
*Chief State Engineer, Louisiana.*

---

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., June 16, 1903.

*Mr. L. L. Griffith, United States Junior Engineer, Vicksburg, Miss.*

DEAR SIR—In compliance with your request of May 8th, 1903, I take pleasure in furnishing you, herewith, a tabulated statement showing the levee work on Red River undertaken by the local levee districts and the State of Louisiana under contracts entered into during the (U. S.) fiscal year ending June 30th, 1903.

IN THE CADDO LEVEE DISTRICT.

| | | |
|---|---|---|
| By the District | 878,778 cu. yds., costing | $135,269.87 |
| By the State | 203,865 cu. yds., costing | 39,249.80 |
| Total | 1,082,643 cu. yds., costing | $174,519.80 |

IN THE BOSSIER LEVEE DISTRICT.

| | | |
|---|---|---|
| By the District | 385,959 cu. yds., costing | $ 65,536.25 |
| By the State | 260,000 cu. yds., costing | 40,170.00 |
| Total | 645,959 cu. yds., costing | $105,706.25 |

On an aggregate in the two districts undertaken by the districts and the State of 1,728,602 cubic yards, costing $280,225.92.

The Red River, Atchafalaya and Bayou Boeuf Levee District was not called upon, during this period, to undertake any levee work on Red River, but on other streams in the district as much as 290,000 cubic yards of earthwork in levees, costing about $60,000, and of work for improving drainage, amounting to about 1,300,000 cubic yards, costing about $175,000, is under way.

The Bossier Levee District, in addition to the levee work shown in the statement furnished as having been placed under contract during this period, is, at this time, advertising for proposals to build new levees at Rough and Ready, 166.5 miles below Fulton, and at Scopini, 207.5 miles below Fulton, amounting to about 205,000 cubic yards.

As you already know, Red River was visited, at a short interval, within the past season, by two high waters of considerable proportions, the first, culminating at Shreveport on December 16th, 1902, reading 34.1 on the gauge, reached stages along many stretches of its length, in the Caddo and Bossier Levee Districts, from one foot to two and a half feet above any waters of previous record.

The second flood, culminating at Shreveport on March 23d, 1903, at a stage there but one foot lower than the first, failed to develop stages at other points as high comparatively as those developed on the first flood.

Notwithstanding these high stages of water in Red River, its levee lines proved equal to the task devolving upon them, except at Thompson's, 130 miles below Fulton. Here a breach in the line occurred and remained open during both floods.

The closure of this breach, as shown by the tabulated statement, has been undertaken by the State, and the new levee there is approaching completion.

The grade of the levees on Red River was found materially deficient at but four places in Caddo, at the head of Simpson's Lake, U. S. Levee, due to execessive settlement; at Hurricane Bluff, built by riparian owners, and at Ashwood and Pascagoula, and in Bossier, at Dortch's and Mercer's, built by district.

Except for caving banks, both floods would have been carried down Red River without serious cause for apprehension to any one concerned.

Owing, however, to the rapid enlargement of the section of Red River, along the Caddo and Bossier Levee District fronts, resulting from the more successful confinement of its flood waters to the main stream by means of levees, than in its past history, the natural tortuousness of the stream, opposing numerous concave bends to the energy of the current, and the serious disturbance of its regimen by the number of cut-offs which occurred during high water, caving banks are more general and serious in these districts than will be readily understood without an intimate acquaintance with the facts.

Hence it follows that 95 per cent. of the work undertaken on Red River during this fiscal years has been placed in new lines of levee rendered necessary by caving banks, and, in addition to this, it appears evident that levee work at the following named points will in the near future, from the same cause, be required:

IN CADDO LEVEE DISTRICT.

| Name of Levee. | Miles below Fulton. | Cu. Yds. |
|---|---|---|
| Elmer Slough to Coushatta Place.......... | 140.5 -141.5 | 125,000 |
| Cedar Bluff .......................... | 150.75- | 55,000 |
| Sterling Bayou ........................ | 156.75- | 25,000 |
| Dixie .................................. | 195.5 -196.0 | 136,000 |
| River Dale ............................ | 201.5 -202.0 | 85,000 |
| Long Point ............................ | 210.0 -210.5 | 50,000 |
| Mussers ............................... | 212.25- | 15,000 |
| Magnolia .............................. | 222.5 -223.0 | 60,000 |
| Lower Cross Keys....................... | 237.5 -238.0 | 25,000 |
| | | 575,000 |

IN BOSSIER LEVEE DISTRICT.

| Name of Levee. | Miles below Fulton. | Cu Yds. |
|---|---|---|
| Rough and Ready........................ | 166.25-166.75 | 100,000 |
| Benoit's Bayou ........................ | 176.75- | 115,000 |
| Pat Cash's ............................ | 184. - | 65,000 |
| Pruitts ............................... | 200.25- | 50,000 |
| Scopini ............................... | 207.75- | 105,000 |
| Mercer's .............................. | 211.5 -212.5 | 95,000 |
| Magenta ............................... | 214.25-214.75 | 50,000 |
| | | 580,000 |

It is also apparent that, as a greater safeguard against future high waters in Red River, the following enlargement should be undertaken in the Caddo Levee District, viz:

| Name of Levee. | Miles below Fulton. | Cu. Yds. |
|---|---|---|
| Blanton Bluff to Scott Slough............ | 117.5 -139.5 | 150,000 |
| Rush Bayou (Old River).................. | 212.5 -213.0 | 25,000 |
| Pascagoula (On Old River)............... | 215.5 -216.5 | 25,000 |
| | | 200,000 |

In the Caddo Levee District, that part of the system above Shreveport terminates, at this time, at Buckhall Plantation. This should be extended as far down at least as Cuba Place, and will require some 600,000 cubic yards of earthwork.

In the Bossier Levee District the line of public levee terminates, at this time, at Bear Point, but should, as soon as the means become available, be extended to the lower boundary of the district, at Swift Chute Bayou. This will require provision for about 150,000 cubic yards of earthwork.

To undertake the work of this fiscal year, both the Caddo and the Bossier Levee Districts have exhausted all their immediate resources and contracted against the revenues of the districts collectable on the tax rolls of future years, up to and including the year 1905.

It is, therefore, evident that any assistance the General Government can possibly accord the districts on Red River, in their struggle for protection against overflow, is greatly needed.

At times, between 1892 and 1900 the General Government fortunately came to the assistance of the levee districts on Red River to some extent, and levees aggregating about 960,000 cubic yards, costing about $143,000, were constructed at certain points in these districts. Beyond this no levee work has been done by the Government on Red River.

On the other hand, from 1892 to date the levee work on Red River undertaken by the local levee districts and State, has amounted to nearly 8,500,000 cubic yards, costing about $1,355,000, not including discount, interest or other incidental expenses of administration.

The particular levees in regard to which I spoke to you some time ago in Shreveport, were the Cavitt Levee, part of the Red Bayou Levee built in 1895-96 by the General Government, and the Dortch Levee, part of the Scopini Levee, built by the General Government in 1894-95. Later, conditions became so grave at both of these places that the districts could no longer defer action in regard to them, and new levees are already under construction at both, payable from funds collectible on future years.

If, in lieu of these two levees, covering breaches in levees built by the General Government, amounting in the aggregate to 385,000 cubic yards, the latter could possibly undertake some of the other work required in the near future in the districts, it would be greatly appreciated by the levee districts, and give them renewed courage in their efforts to maintain their lines of defense against the high waters of Red River. Respectfully,

(*Signed*) Frank M. Kerr,
*Assistant State Engineer.*

"STATE OF LOUISIANA,
"OFFICE BOARD OF STATE ENGINEERS,
"NEW ORLEANS, LA., Oct. 10, 1902.

"*To the Honorable Boards of Levee Commissioners for the Atchafalaya Basin Levee District and the Lafourche Basin Levee District*:

"GENTLEMEN—The resolutions passed at your joint session held in Donaldsonville on July 21, 1902, request the Board of State Engineers to report the proper location, with plans and specifications and estimates of cost, of a temporary dam at the head of Bayou Lafourche, to be built in accordance with the provisions of the several acts of the Legislature of the State of Louisiana and of the Congress of the United States.

"In compliance with this request examinations and surveys have been undertaken, and are now sufficiently advanced to allow us to submit the following preliminary report through your executive committee for your consideration.

"Act No. 9, passed by the State Legislature in 1900, authorizes you to place locks at the head of the bayou, the work to be subject to the supervision of the 'Federal authorities' and in accordance with 'plans and specifications to be furnished or approved by the Secretary of War.' The act provides that it shall go into effect as soon as the Federal authorities have given their consent. This act, however, gives no specific authority for closing the bayou—temporarily or otherwise—in any other manner than by locks at its head.

"The act of Congress, known as the rivers and harbors act (Public No. 154), approved June 13, 1902, presumably gives the consent requisite for putting in force the above-named act of the Legislature, in pursuance of which your organization is effected, as it authorizes you to construct a 'lock and dam' at the head of the bayou, subject to the supervision of the United States engineers, on plans to be furnished by you and approved by the Secretary of War.

"This act of Congress also authorizes the Secretary of War, 'pending the construction of said lock and dam,' to grant you permission 'to place a temporary dam across the bayou,' near its junction with the Mississippi River, and to maintain it for a period not exceeding two years and six months from the date of the act—that is, until December 13, 1904—provided, that the State of Louisiana legally authorizes you to construct the same, and that you enter into agreement with the proper officer of the United States, with security, for its removal at or before the time prescribed.

"Finally the act of the State Legislature, No. 84 of 1902, authorizes you to place a temporary dam at the head of Bayou Lafourche pending the construction of locks, as provided for in Act No. 9 of 1900,' etc.; provided, 'the dam shall not be placed or begun before January 1, 1903.' The act also requires you, before beginning the construction of the dam, to enter into an agreement with the proper officers of the United States, etc., for its removal before the date prescribed in the act of Congress; and furthermore to 'maintain a depth of not less than six feet by not less than sixty feet in width of fresh water throughout the Bayou Lafourche' from the time of placing the temporary dam until the completion of a lock

"You are thus permitted, under the several acts mentioned, to organize for joint action and to take some preparatory steps toward the end you have so long had in view, of opening Bayou Lafourche to constant navigation while closing it against destructive floods.

"But the laws permitting you to act contain restrictions that must make the accomplishment of your purpose difficult, if not uncertain. For instance, you can not begin work on a 'temporary dam' before January 1, 1903. But during the eleven years from 1891 to 1901, inclusive, the water surface at Donaldsonville, on the first days of January, has read from 2.6 feet to 13.4 feet by the Government gauge, the average reading that day being 6.6 feet, at which stage the closure of the bayou would be attended by difficulties not usual in the construction of levee dikes, and during the month of January, in these eleven years, the stage of water has varied from 2.1 feet on January 17, 1895, to 22.5 feet on January 31, 1901. It is thus apparent that the successful completion, or even the beginning, of a dam after the first day of January and before the usual time of high water in any year, is, to some extent, uncertain.

"As the temporary dam must be removed by December 13, 1904, and as the locks can not be built at any reasonable cost except under the protection of the temporary dam, it might be reasonably doubted whether or not it would be worth while to build the dam at all if its beginning must be delayed until the low water season in the summer or autumn of 1903. If it is built in the summer of 1903, it can only be of use—under the law as it now stands—during the single high water season of 1904. It would have to be removed before the high water season of 1905—that is, before it is at all probable that a lock could be completed.

"If the temporary dam could be lawfully begun to-day, when the water is low and the upper rivers generally falling, there should be no reasonable doubt of its successful completion this season.

"Certain requirements of the second act of the State Legislature (No. 84 of 1902) add to the natural difficulties of the situation. The required maintenance of a channel of fresh water six feet deep and sixty feet wide throughout the bayou from the time of placing the temoparary dam until the completion of a lock, presents a problem not readily solved. If sufficient time were allowed after the dam is built to dredge the required channel or to build auxiliary dams and pump up the necessary six feet of water, the work might be easily done, but it can not now be assured that you will be able to supply the requisite depth of channel until some months after the placing of a dam.

"The requirements that there shall be fresh water throughout the bayou at all times must also involve considerable time and a large amount of work and expense, in whatever manner its execution might be attempted. It fortunately happens, however, that an ample supply of fresh water can be obtained from the natural drainage area on either side of the bayou by making canals to connect them with it; although the introduction of water from some of these sources, that might prove the best and most desirable appears to be prohibited by that part of the law which only permits 'lake connection below the lower line of the parish of Assumption.' Also a supply of fresh water can, of course, be readily had from the Mississippi river whenever it is high enough for the successful operation of siphons, though at extreme low water stages there has never been a flow of any consequence from the river into the bayou—the sandbars in its bed having at such times formed natural temporary dams.

"Considering the facts and circumstances as above stated, we are of the opinion that the best method of carrying out your purpose in compliance with the intent of the laws, will be (1) to build the temporary dam of earth, in the same manner as an ordinary dike or levee; (2) to dredge the bayou to the required depth and width wherever it is now deficient at extreme low water, and (3) to introduce fresh water by opening canals from Lake Beouf on the left bank, or from Lakefield on the right bank, or from both.

"We have made detailed surveys at the head of Bayou Lafourche and have prepared a map showing proposed location of a temporary dam, with suggested site for a lock.

"The proposed line of location crosses the bayou nearly at right angles from a point about 100 feet northeast of Iberville street in Donaldsonville, where the required embankment, including the connecting levee on the north side, would be about 400 feet in length. The dam proper, from bank to bank of the bayou, would be only about 230 feet long, with an extreme height of say 39 feet. This location would leave room to build a lock between the dam and the bridge at Nicholls avenue, with a chamber 250 feet or more in length.

"If the dam is built with a crown thirty feet wide and with side slopes of three horizontal to one vertical, as is shown on the map, there would be required about 35,000 cubic yards of embankment; about 30,000 cubic yards of which would be in the dam proper. If built with a crown ten feet wide and banquette twenty feet wide at ten feet below grade—which is a usual form of levee construction—the cubic contents would be reduced by about 3,000 cubic yards.

"If the stage of the river is below, say, ten feet by the Donaldsonville gauge on January 1, 1903, and so remains for a sufficient length of time, the earth necessary to build the dam and connecting levee can be obtained from the batture on the river side of the levee, within, say, 200 yards of the embankment. But should the river rise during the progress of the work, access to the earth on the batture would be rapidly cut off, and the available supply reduced by the increasing height of the water, and it would then be found necessary to obtain earth from pits on the land side of the levee.

"As it is possible that such land side borrow pits could only be had after prolonged expropriation proceedings or by purchase at exorbitant figures, it may be well to consider the propriety of attempting to move earth from low lying areas on the batture to a higher level while the river remains low, so as to have material accessible in case of a higher stage of water.

"In any event it would be a wise precaution to begin the building of the connecting levee at the earliest date practicable taking the earth required from the lowest level permitted by the stage of the river. The beginning of work upon the temporary dam must, of course, under the law, be delayed until January; but should the river be rising at that time it would go far to insure the completion of the work to have earth in a position to be available above water, and to have the 5,000 cubic yards in the connecting levee already in place.

"We have surveyed cross sections of the bayou from levee to levee, at stations located about every half mile, between Donaldsonville and Lockport with a view to estimate the amount of dredging necessary to secure the channel prescribed by law. Results based upon measurements taken at such wide intervals are, of course, more or less inexact, but it is reasonable to assume that they afford a fair approximation to the actual requirements. Below Lockport, it appears probable from former surveys by the United States engineers and from recent reconnaissance, that the prescribed channel already exists and that no dredging will be needed.

"When a dam or lock is built at the head of the bayou and lake connections are opened, the water surface will generally remain near mean Gulf level, or probably a little higher in the rainy season or under the influence of prevailing southeast winds. A water prism 60 feet wide at mean Gulf level and 6 feet deep, as called for in the act of the Legislature, with side slopes of 3 to 1—which is probably as steep as they could be maintained—would require, according to the cross sections above mentioned, the dredging of about 650,000 cubic yards of material from the bottom of the bayou.

"There are few places, if any, where the dredged material can not be deposited within 10 or 20 feet of the edge of the 60-foot channel, though in some cases it may be necessary to place it at a greater distance to prevent sloughing.

"There is nothing in the law to prevent the beginning of this dredge work at any time you see fit to undertake it. Should it happen from any cause that you fail to build the dam before the flood season of 1903, there might be a considerable loss of depth or width in any channel previously dredged from material washed back into it by the high water current; but this is a risk which, under the circumstances, we presume you will not hesitate to take.

"After extended exploration and examination of the waters adjacent to Bayou Lafourche on both sides, we conclude that the best sources for supplying fresh water by lake connections below the lower line of the parish of Assumption' are Lake Boeuf and Lake Field.

"Lake Boeuf lies on the left bank of the bayou, and receives, or is directly connected with, the drainage from nearly the entire basin above Raceland between Bayou Lafourche and the Mississippi river, or from an area of over 400 square miles; while Lake Field and Lake Long, with which it is connected—lie in a basin on the right bank of the bayou below Thibodaux, having an area of at least 150 square miles. We have made surveys for canal to connect these lakes with the bayou at points that appear most available for the purpose. The survey for Lake Boeuf connection joins the bayou about three and one-half miles above Raceland, and runs through Home Place plantation, belonging to Alexander Theriot, very near its upper boundary line. The length of surveyed line is 2.4 miles, about .4 of a mile of which is in the bed of Lake Boeuf. The line surveyed for connection with Lake Field is along the old Company Canal from Lockport, and is about 1.2 mile in length, about .2 mile being on the lake.

"Taking the bottom of the canals at a depth about 3¼ feet below mean Gulf level—that is, low enough always to have at least 3 feet of water in them—the deepest cut required on the Lake Boeuf Canal, except through the levee and the railroad embankment, would be 13 feet, and on the Lake Field Canal the deepest cut, except through the levee, would be about 12 feet.

"In both cases there are existing canals along the lines or along some part of them, which to some extent reduces the quantity of excavation now required. But those old canals are of little value for the present purpose from the fact that a large part of the material originally taken from them would have to be moved again in their enlargement.

"The work required to excavate these canals could probably be most economically done by floating dredges; though a large part of it might be done by other methods of dry land excavation.

"Estimating the earth to be moved in cutting these canals on the basis of a bottom width of 24 feet, at the elevation above stated, and side slopes 1½ horizontal and 1 vertical, there would be about 110,000 cubic yards in the Lake Boeuf canal and about 50,000 cubic yards in the Lake Field canal.

"Bridges across the canals would be necessary for the public roads along the bayou, and also across the Lake Boeuf Canal for the Southern Pacific Railway track, with possibly one or two others for the convenience of private owners.

"When the canals are opened their lake entrances should be guarded by booms to keep out floating aquatic plants, and constant care should be exercised to exclude and remove all such growths from the canals and the bayous. The relative order in which the several parts of the work above outlined should be undertaken and prosecuted is perhaps a matter of no great importance, as it is plainly desirable to begin them all while the rivers remain low and to complete them at the earliest moment possible. There is no physical reason why any part of the work might not begin to-day, but the temporary dams, of course, can not be lawfully begun until the 1st of January next year.

"Work on the connecting levee and for placing earth in position to be used in the dam should begin as soon as you can undertake it. The dredging of the bayou and the cutting of the Lake Boeuf connecting canal should also be begun at the earliest possible date. The cutting of the Lake Field Canal might be delayed until a dredge, either from the Lake Boeuf Canal or from the bayou itself were ready to undertake it.

"Dredge work in Bayou Lafourche should begin at its head near the site of the dam, and thence proceed down stream, and at the same time work should be begun on the connecting canal from Lake Boeuf toward the bayou.

"Besides the making of contracts and agreements for the actual execution of the work, you will have a number of preliminary matters to arrange before it can be prudently commenced. The right of way for cutting the canals connecting with Lake Boeuf and Lake Field, as well as agreements giving you permanent control over them, should be secured; and under both the State and the United States laws, before you can begin the temporary dam you must obtain the permission of the Secretary of War, and enter into agreement with the proper United States officer, with security, for its removal.

"It would be well to have an understanding with the Southern Pacific Railway Company relative to the crossing of its track by the Lake Boeuf Canal, and the passage of a dredge, and also to secure an option upon land suitable for a barrow pit at the head of the bayou in case the stage of the water in January should require it.

"Both of your districts have contracts for levee work at prices scaled acording to the height of embankment called for. The maximum price stipulated in either contract is twenty-nine cents per cubic yard of earthwork in any 'station' (i. e., a length of 100 feet) of levee having an 'average gross height of twenty-four two twenty-five feet.' We, therefore, take a fraction over this figure, or thirty cents as a fair price per cubic yard for estimating the probable cost of the earthwork required in the temporary dam and connecting levee; and, considering the long haul probably required for placing earth in position to be available in case of an early rise of the river, as well as the general risks and difficulties attending the completion of the dam, we put the same price upon the earth that is to be moved a second time.

"The dredging required in Bayou Lafourche, we believe, from careful comparison of its general character with that of dredge work now under contract in other places, should be done for a price not exceeding 12½ cents per cubic yard. It is possible that the excavation of the canals connecting the lakes with the bayou may cost a little more per yard than the dredgework in the bayou itself (principally for the reason that the quantity required is smaller), but we conclude it safe to estimate it at the same price.

"We have put no definite price upon the probable cost of right of way, of bridges or of land that may be required for barrow pits, but have added for these purposes and for other contingencies a sum that brings the total to a round figure of $125,000, made up as follows:

| | |
|---|---|
| Temporary dam and constructing levee, 35,000 cubic yards, at 30 cents | $ 10,500 |
| Earth for same to be moved a second time, say 10,000 cubic yards, at 30 cents | 3,000 |
| Dredging channel in Bayou Lafourche, 650,000 cubic yards, at 12½ cents | 81,250 |
| Cutting connecting canals from lakes, 160,000 cubic yards, at 12½ cents | 20,000 |
| Right of way, bridges, land for barrow pits and contingencies, say | 10,250 |
| Total | $125,000 |

"Should you decide to undertake the work as above outlined, we should be ready at your request to prepare detailed specifications as occasion may require.

"Respectfully submitted,
*"The Board of State Engineers,*
*"Per* Henry B. Richardson,
*"Chief State Engineer."*

STATE OF LOUISIANA,
Office Board of State Engineers,
New Orleans, La., Nov. 12, 1903.

*To the Executive Committee of the Joint Organization, Atchafalaya Basin and Lafourche Levee Boards, New Orleans, La.*

Gentlemen—I beg to report to you that I have lately inspected the work going on on Bayou Lafourche and Lake Boeuf Canal in connection with the Lafourche locking project.

I find that the dredge located in the vicinity of Donaldsonville has cut about one and one-half miles of channel up to date. This channel has pretty generally been cut out to the required dimensions. A certain amount of filling has taken place owing to the fact that the bayou is still open and the river water charged with sediment still enters Bayou Lafourche.

Dredge No. 2, which is cutting the bar just below the Howell crevass, has cut out about two miles of work up to date and is cutting the channel to the required dimensions, but in this case also a certain amount of filling has occurred, owing to the same cause as above, and owing to the fact that the material is deposited on a soft sand bar formation, which is mashed into the channel by the weight of the material deposited on it.

These two dredges, however, have done effective work, and upon the closure of the bayou the channel which they have cut will be found very nearly down to the required depth.

The third dredge at work, cutting from Lake Boeuf into Bayou Lafourche, has cut about 3,500 feet of canal up to date. This canal has been cut through the prairie. It has been cut much in excess of the dimensions called for, but owing to the soft nature of the prairie on which the material is deposited, the sides have a tendency to be mashed in, and the bottom has a tendency to fill with soft material. This, however, is inevitable in canals cut through prairie marsh.

As a whole, the work is progressing rapidly and satisfactorily.

I recommend that you order the beginning of the dam as soon as possible, as the present stage of the river at Donaldsonville is such that the work can be executed with a minimum of difficulty. It is rare that conditions as favorable as the present can be found at Donaldsonville, and for that reason I urge the beginning of the work at once, because any delay would probably find the water at a higher stage of the river, and, therefore, render the closure of the bayou very difficult, if not impossible.

I beg to urge you to meet as soon as possible the expenses incurred for inspectors' salaries, and expenses. The nature of the specifications which you have adopted for the work is such that it is necessary for the work to be inspected thoroughly and intelligently at all times,and the inspectors have now been working some sixty days without salary and without their expenses being paid. Under the circumstances, it is difficult to get proper work, and a failure of constant soundings and investigations on the part of the inspecting force will make it very difficult, if not impossible, to ascertain the amounts due under the contract.

The plans and specifications for the lock have been for several months in the hands of the United States Engineers and the Secretary of War, and I am informed are being very thoroughly inspected by them. An early report on these plans may be expected.

Very respectfully yours,

Arsene Perrilliat,
*Assistant State Engineer.*

---

STATE OF LOUISIANA,
Office Board of State Engineers,
New Orleans, La., Feby. 8th, 1904.

*Hon. J. S. Brady, Chairman Executive Committee, Joint Organization, Atchafalaya Basin and Lafourche Levee Boards.*

Dear Sir: In accordance with the instructions of the Executive Committee and a letter from the Presidents of the Atchafalaya Basin and Lafourche Levee Boards, I proceeded to Washington to endeavor to secure, through the efforts of Mr. R. F. Broussard, Member of Congress, an extension of the time for the removal of the temporary dam placed at the head of Bayou Lafourche.

Mr. Broussard, upon whom I called immediately upon my arrival in Washington, suggested that the matter be left to the decision of the Rivers and Harbors Committee, who had charge of all such matters. He arranged for a hearing to be given me on the subject by a sub-committee of the Rivers and Harbors Committee. Mr. Burton, Chairman of the Rivers and Harbors Committee, at Mr. Broussard's request, appointed such a sub-committee, composed of himself, Mr. Dovenor, of Ohio, and Mr. Randall, of Louisiana. I explained to these gentlemen the reasons which had occasioned the delay in undertaking the construction of the locks, and explained at length the position of the two levee boards in relation to this.

My remarks were frequently added to by Mr. Broussard, when he saw that a point might be made which would convince the sub-committee.

At first the sub-committee seemed inclined to extend the time for two years, and further authorize the Secretary of War to extend the time for two additional years, in case the work justified this extension; but after the committee had heard the matter at length, they decided to grant the original request, which was for a flat-footed extension of three years to begin from December 13, 1904. They will incorporate in a short Rivers and Harbors Bill, which they propose to pass at this session, the required extension of time, and Mr. Broussard has agreed to see that this item was duly incorporated in said Rivers and Harbors Bill.

I enclose you copy of the documents which were presented by me to said Rivers and Harbors Committee.

I cannot too strongly emphasize the valuable assistance which Mr. R. F. Broussard gave in this matter, and I consider it mainly due to his tact and resources that the matter went through so easily.

Very respectfully,

Arsene Perrilliat,

*Assistant State Engineer.*

---

STATE OF LOUISIANA,
Office Board of State Engineers,
New Orleans, La., March 2, 1904.

*Major Henry B. Richardson, Chief State Engineer.*

Dear Sir: With regard to the letter of Capt. Charles S. Bromwell, dated February 29th, accompanied by enclosure, which you referred to me for answer, I beg to state the following, viz:

The Atchafalaya Basin and Lafourche Levee Boards are progressing with all of the energy with which they are capable in the work of the closure of Bayou Lafourche with a lock and dam. The dam has been constructed. Dredges have been working since last September to cut out a six-foot channel in Bayou Lafourche, imposed upon them by legislative enactment.

Two dredges are working in Bayou Lafourche, and have cut, up to date, some ten miles of channel. This is mostly six feet deep, although in some places it is somewhat scant in depth and will have to be gone over by the contractors. The two dredges engaged in doing this work are about eight miles apart, working towards each other. When working satisfactorily, one dredge will cut about one and one-fourth miles per month. A third dredge is now engaged in cutting a canal from Lake Bœuf to Bayou Lafourche to furnish fresh water as contemplated by law, and in about two months this will be completed. It is then the intention of the levee boards, to have this third dredge join the other two dredges in their excavation in Bayou Lafourche.

The levee boards have authorized anyone wishing to do so to put freight transfers across the dike at Donaldsonville, so that freight might be transferred from the Mississippi River into Bayou Lafourche. The Levee Boards have also authorized parties owning private canals now abutting against the levees to cut said levees so that the private canal will open into Bayou Lafourche. As these canals connect with New Orleans by complete waterways and systems of locks, as soon as this is done there will be through navigation from New Orleans into Bayou Lafourche and up said stream. The canals authorized to be open are in the vicinity of Lockport.

Owing to the delay to which the Levee Boards have been subjected by legal proceedure instituted against them, preventing them from beginning the lock work, the levee boards have been compelled to call upon Congress to extend the time allowed them for the completion of the locks at Donaldsonville. This matter has been referred to the Rivers and Harbors Committee and has received its favorable consideration.

The above covers, I believe all the points mentioned in the letter accompanying that of Capt. Bromwell, and I have reason to believe that the levee boards are complying with the law and pushing the work ahead as fast as conditions will permit.

Very respectfully yours,

Arsene Perrilliat,

*Assistant State Engineer.*

P. S.—In addition to the above, the levee boards have contracted for a battery of five 18-inch siphons, to be placed over the dike, so as to siphon Mississippi River water into Bayou Lafourche during the coming high water, and thereby supplement the effect of the fresh water canals being dug.

STATE OF LOUISIANA,
Office Board of State Engineers,
New Orleans, La., March 31, 1904.

*Hon. J. S. Brady, Chairman Executive Committee, Joint Organization, Atchafalaya Basin and Lafourche Levee Boards, New Orleans, La.*

Dear Sir: I have to report to your Honorable Committee that the inspectors' report for the dredging on Bayou Lafourche for the week ending March 26, show that the Sidney C. has cut about 965 feet during the week, that the Eclipse has cut about 1,900 feet during said week, making a total of 2,865 feet cut. The cut of the Sidney C. was a continuous cut down to the required depth, and pretty nearly of the required width. The cut of the Eclipse was not continuous, and there were 800 feet of the 1,900 feet cut that were sufficiently deep to allow the boat to pass without cutting. The cut of the Eclipse as shown by soundings behind the dipper was generally down to the required depth, but not to the required width. The inspector reports that some of this has filled up. The distance that the two dredges are apart now amounts to 312 stations or about 6 miles.

I have to report that this morning I visited the dike at Donaldsonville. I find that the cut for the siphons has been made through the dike. This cut is about 6 feet below the top of the dike, or about two feet deeper than the depth recommended in my letter of March 9th, 1904. One of the siphons seemed to be pretty nearly all connected up. Another one is in place, but not connected. I saw a number of pipes, in addition to this, on the side of the dike. The sheet piling, about 100 feet bayouwards of the bayou slope of the dike has been driven in.

I have to report that the land slope of the dike seems to be sloughing to a certain extent. The gauge this morning read 19¼ feet. There is every reason to believe that it will go 7 or 8 feet higher. As the river rises, sloughing will increase. It is apparent to my mind, from a thorough investigation of the situation, that a layer of quicksand underlies the foundation of the dike, that through this quicksand the water seeps, owing to the pressure on the river side, and in seeping through this layer carries with it a certain amount of sand, which bubbles up on the land side of the dike. The amount of sand thus carried through leaves cavities under the dike, which have to be refilled in some way, and this is done by the land slope dropping into these cavities and thus breaking away from the dike.

I think this matter requires your attention, and some remedy, and I would suggest that your next meeting, on April 7th, be held at Donaldsonville, so that you might order such work at that point as may be necessary. I shall then be prepared to go into further details with you and suggest a plan of action. I also wish to state that this sloughing and the natural settling of the dike will bring the surface of the siphon cut lower down as the water rises, and, although at present, the surface of the cut stands two feet above '97 water, it may reach a considerable lower grade than that during extreme high water.

Respectfully submitted,
ARSENE PERRILLIAT,
*Assistant State Engineer.*

---

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 13th, 1904.

*Mr. J. S. Brady, Chairman, and Members of the Executive Committee, Joint Organization, Atchafalaya Basin and Lafourche Levee Boards.*

GENTLEMEN: In accordance with your request, I visited, with some of the members of your Committee, on April 9th, and again on April 12th, the dam recently built at the head of Bayou Lafourche. This inspection was made as a result of the report addressed to your Committee some ten days before, and calling your attention to the fact that the land slope of the dike showed considerable leaking and sloughing.

The examination on the two above mentioned dates showed that the leaks and sloughs had increased to a certain extent since the date of my first report to you. In corroboration of the verbal report which I made to you on the ground, I cannot say that the dike is in any apparent danger; yet it may be that with the rising river (which is going to continue rising for some ten days longer) the leaks and sloughs may increase to an alarming extent. For that reason, I recommended to you on the ground that a force be placed at once on the dike, in order that earth may be thrown in the water on the river side of said dike for the purpose of adding material to the river slope of said dike. This process, known as "blanketting," is familiar to you, and has generally proven efficient in stopping excessive seepage and leaks. It is immaterial, in my mind, whether a wheelbarrow force or a scraper force be employed, but it is important that this force should be of sufficient magnitude (not less than 20 scrapers or 100 wheelbarrow men) and placed to work at once, so that it might be ready to meet any emergency which may arise. Any delay in this would be taking chances which I think should not be taken.

Material for this work can be procured on the land side between the bayou and the levee line, but should not be taken nearer than 150 feet from the foot of the slope of the dike. Only a limited amount of material can be found there, but a large and suitable pit exists in convenient proximity to the dike in Port Barrow, adjoining the excavation marking the old Port Barrow Fort.

Members of your Committee discussed the advisability of using a hydraulic dredge for the purpose of filling the river slope of the dike. It is well established that a hydraulic dredge could not place material on the slope of the dike, as it would necessitate placing the discharge pipe so close to the dike that there would be danger of washing away the surface of the dike itself instead of forming deposit on it. The material deposited by a hydraulic dredge would be lodged some little distance from the slope of the dike, perhaps 75 to 100 feet, and although such work would be efficient in filling up the basin in front of the dike, and thereby a desirable thing for the levee, yet it would not accomplish what, to my mind, is most needed to the dike, that is, the blanketting process, or the addition of earth to the surface of the slope itself so as to intercept and diminish the seepage and leaks. A combination of the two methods could only result beneficially; but I cannot urge too strongly the necessity of organizing and putting to work the land force without delay.

Very respectfully,
ARSENE PERRILLIAT,
*Assistant State Engineer.*

---

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 21, 1904.

*Mr. J. S. Brady, Chairman, and to the Members of the Executive Committee, Joint Organization, Atchafalaya Basin and Lafourche Levee Boards.*

GENTLEMEN: Enclosed please find copy of correspondence from Brig. General A. Mackenzie, Chief of Engineers U. S. Army, Senator Samuel D. McEnery and Governor W. W. Heard, which explains itself.

I judge from this correspondence that General Mackenzie has made no opposition to the Lafourche Lock extension going through, and therefore I presume this extension of time has become a law. At the same time, it appears to be the desire of General Mackenzie, of Senator McEnery and of Governor Heard that the Atchafalaya Basin and Lafourche Basin Levee Boards should give bond for the removal of the dam at the expiration of three years from December 1, 1904.

It is evident from this that the law which has been passed by the Congress of the United States does not provide for this bond, and in fact I am under the impression, from my conversation with Representative Broussard, that such a bond would not be incorporated in the law to be passed on the subject. The Levee Boards have given bond to remove the dam on or before December 13th, 1904.

I would suggest that the Levee Boards enter into correspondence with General Mackenzie, telling him that they will endeavor to give such bond, but especially assuring him that it is the intentions of the two levee boards to comply strictly with the law, pointing out the fact that being officers of the law they have no other alternative but to obey the law, and telling him that the Levee Boards would be willing to bind themselves by resolution, or otherwise, to remove the dam at their own expense in December, 1907, if directed to do so by the Secretary of War. It might be that the War Department would be satisfied to accept such a resolution and would not require the giving of bond.

Very respectfully yours,
Arsene Perilliat,
*Assistant State Engineer.*

---

STATE OF LOUISIANA,
Office Board of State Engineers,
New Orleans, La., Nov. 18, 1902.

*Major Robt. L. Strong, General Agent Texas and Pacific Railroad Company, New Orleans, La.*

Dear Sir: Referring to our conversation of yesterday, I have to inform you that the Fifth Louisiana Levee District has about completed an embankment or levee extending from near Bougere Landing and tying on your railroad embankment at Station 441Q. That the State of Louisiana has advertised for the construction of a levee line joining your railroad embankment at about Station 4145 and extending along the river front to the lower line of the Witlacochee Plantation. This line leaves the railroad embankment through the Bougere Swamp, from Station 4410 to 4145, or 265 stations, to act as a levee until such time as the United States Government, or the State or District, are able to construct a levee line through the Bougere Swamp, connecting the work completed and contemplated in that vicinity.

Upon surveys made by this office, we find that the railroad embankment through the Bougere Swamp proper, which is now to act as a levee, has no margin in height above the high water of 1897, and that our wing which joins your work at the upper end stands 6 feet above your embankment; that while your embankment has an 18-foot crown, with slopes of 1½ to 1, the levee line has an 8-foot crown, with slopes of 3 to 1, with banquette 20 feet wide.

It is very plain from this statement that in case of high water your railroad would be far weaker in section and in height than the levee line. In my judgment, in order for you to contend with a high water, your embankment through Bougere Swamp should be raised not less than two feet without delay; and I would suggest that the necessary material with which to raise the embankment be brought to the work in cars, as to secure the material from either side of the embankment would materially weaken it.

I call your attention to this because in my conversation with Mr. Thorn and Settalee, before advising the Fifth Louisiana Levee District to undertake the work from Station 4410 to Bougerre, I called their attention to the fact that they would have to maintain their railroad embankment until such time as a levee could be constructed.

I would also state that the Mississippi River Commission on its recent trip down the river failed to make any special allotment for the construction of the levee through Bougere Swamp. I would also remind you of the fact that from Cut Off Bayou to Sugar House Chute, the grade of your railroad embankment drops until it is six or seven feet below the high water marks on the trees, showing that in case of any high water, even though it be but a bank-full stage in the river, the line of your railroad would be submerged, and after the completion of our line to Witlacochee, the current coming around the lower end of the levee system would wash your rails up into the trees, and practically compel you to reconstruct your road from that point to Sugar House Chute, a distance of 12 or 14 miles. While I have no direct interest in this latter proposition, I believe that it would be greatly to the interest of your railroad to raise its grade to such an elevation as to be able to successfully operate it at all stages of the water, nor do I believe that it is within the power of the present authorities to ever give absolute levee protection against the back water of Red River, or a certain amount flowing across country from the Mississippi River towards the Atchafalaya River in high water time, as the mouth of Old River will have to be left open for an unlimited time, and with that open the water it bound to back up to about the elevation found on the timber in the swamps through which your line passes.

I would be very much obliged of you would take this matter up with the authorities of your road, knowing that our interests are common, and that with little additional expense the railroad can be operated at all stages of the Mississippi River with an intact levee system above.

With regards, I remain,

Yours very truly,
M. P. Robertson,
*Assistant State Engineer.*

---

STATE OF LOUISIANA,
Office Board of State Engineers.
New Orleans, La., March 9th, 1903.

*Hon.* .......................... *Prest. Board of Commissioners,*
.................... *Levee District.*

Dear Sir: Information received in this office from nearly all the Levee Districts, indicates that the public levees are now being injured to an unusual extent by hauling, driving and riding over them, by the trampling of stock and by obstructed drainage.

Act No. 108 of 1888 makes it a misdemeanor to "ride, drive or haul on any public levee."

Act No. 60 of 1890, and Act No. 46 of 1894 make it unlawful for stock of any description to go on the levees, or the space between the levees and the drainage ditch, during the time that the water is against the levees, and Section 2 of Act No. 84 of 1884 authorizes the killing of "hogs found at any time, running at large upon the public levees."

Act No. 16 of 1892 prohibits the placing of obstructions on the levees, and the tying or fastening of logs or timber to them during high water.

Act No. 119 of 1902 requires the drainage of all public roads contiguous to the public levees, and prescribes penalties for obstructing such drains or ditches, whether public or private.

Act No. 98 of 1892 prohibits the flooding of lands for irrigation within five hundred feet of the levee on the Mississippi River, and the discharge of siphons within twenty-seven feet of their base, etc.

The temptation to use the levees as highways of travel—due to the present almost impassable condition of the roads—and the existing high stage of the rivers, seems to call for a stricter application and enforcement of the laws above referred to than has been customary in many places.

We have, therefore, thought this a proper occasion to again ask the attention of all the Levee Boards of the State to this important matter, and to urge that such action be promptly taken as may be necessary to prevent and correct the abuses in question.

Very respectfully,
*The Board of State Engineers,*
*Per* Henry B. Richardson,
*Chief State Engineer.*

---

STATE OF LOUISIANA,
Office Board of State Engineers.
New Orleans, La., July 27, 1903.

*Mr. Leon Lemaire, Special Committee appointed by the Town Council of New Iberia to investigate the possibilities of constructing a Ship Canal from New Iberia to Tide Water.*

Dear Sir: I beg to report to you that, in accordance with the instructions of His Excellency, W. W. Heard, Governor of Louisiana, I proceeded to New Iberia, on Saturday, July 18, 1903. I was put in possession, through your courtesy, of maps and profiles of a survey which had been made to connect the Town of New Iberia with Bayou Carlin. I examined the maps and profiles with care, and also went over the ground of the proposed line, which runs generally in a north and south direction, from New Iberia to Bayou Carlin, a distance of about ten miles. I had occasion to converse with a number of the residents of the country through which this proposed canal runs, and gathered from them such information as I thought would give me an intelligent idea of the project proposed.

I beg to state that I found the surveys and calculations outlined approximately correct. It is my belief that the canal proposed could be built without difficulty and of the dimensions mentioned in the profiles referred to. This would have a bottom width of twenty (20) feet, a width at water surface of thirty-eight (38) feet, and a top width which would vary according to the depth of the cut. The slopes specified are generally one and a half horizontal to one vertical. The depth of the cut would vary from a maximum of twenty feet to a minimum of six feet. The work would consist of about 906,000 cubic yards, which certainly should be done at a price varying from eight to ten cents per cubic yard; that is, at a cost between $74,000 and $90,000. The digging is good and easy, through fairly soft material. It would only pass through a very short length of timbered swamp, and that is not of an especially heavy character.

The canal being fairly straight, and on account of its great depth, would afford excellent drainage to the country bordering it. This would be made all the better from the fact that the canal being a tide-level navigation canal, would afford a greater fall to the drains coming into it than an ordinary drainage canal would give.

I consider the project easily feasible from an engineering standpoint, and one which could be executed at reasonable cost.

I believe that with a little skill and study the bottom width of the canal could be increased, while the flatness of the slopes could be decreased with safety, thereby increasing the area of the waterway, and, with proper judgment, doing this without increasing the amount of excavation and therefore the cost of the work.

From the investigation which I have made of this proposed work, I believe it to be a very desirable one both from a standpoint of drainage and from that of the commercial prosperity of the Town of New Iberia, and I can see no special difficulty in executing it.

I shall be pleased to lend any further assistance to the project which lies within my power.

Very respectfully yours,
Arsene Perrilliat,
*Member Board of State Engineers.*

STATE OF LOUISIANA,
Office Board of State Engineers.
New Orleans, La., April 11th, 1904.

*Messrs. J. K. Jeffries and Son, Contractors, Plaquemine, La.*

Sirs: The receipt of your petition, relative to the Arlington Levee, in the Parish of East Baton Rouge, La., addressed to the Board of State Engineers of Louisiana, and filed by your Mr. J. K. Jeffries, on the 2nd inst., is hereby acknowledge.

The petition, on certain grounds advanced by you, requests a reconsideration by the Board of State Engineers of the basis of the final settlement made with your firm for the construction of the Arlington Levee, in the Parish of East Baton Rouge, and certain relief.

The allegations and arguments advanced by you, in palliation of your delay in completing the Arlington Levee, at the proper time, and in support of your claims for relief, may be summed up as follows, viz:

1st. Certain physical difficulties caused by the cultivation of rice over a part of the line of levee projected for construction.

2nd. The stage of the river when these difficulties no longer existed and operations were otherwise possible.

In reply, the Board of State Engineers would recall to your mind:

That you entered into contract with the State of Louisiana to build the Arlington Levee on May 19th, 1902. The contract stipulated that work should be begun on or before June 1st, 1902, and completed on or before December 1st, 1902. The survey of the line of levee, and nature of the topography of the locality were familiar to you. Your allegation that the line of levee ran through a rice field is not wholly borne out by the facts of the case. There were 2,500 feet of work through a rice field, the yardage of which amounted to about 115,000 cubic yards, and over 2,800 feet of work through a cotton field, the yardage of which amounted to about 121,000 cubic yards. If you could not have gone to work on June 1st, on that portion of the levee through the rice field, for which you had received notes, there were no physical difficulties to prevent you commencing work on that portion of the levee line that went through the cotton field.

Letters dated June 25th, and August 8th, 1902, were written to you by members of the Board of State Engineers calling your attention to the fact that up to those dates nothing had been done towards the actual construction of the levee by you. On September 8th, about three motnhs after the work should have begun, you started work on this levee with an outfit averaging not more than 30 wheel scrapers per day for that month, although you had been advised by letter of August 8th, that if the work had been started on that day, a force of more than 100 scrapers would be required for the completion of the levee within the stipulated time, and that as the delay in beginning work went on, the force necessary for its completion within the stipulated time would become larger and larger. At no time did you have more than 59 wheel scrapers at work, and that was as late as the latter part of January, 1903, and then only for a short period.

Not until the 30th of December, 1902, nearly one month after the Arlington Levee should have been completed under your contract, did the water in the river reach the same level as the natural surface of the land at Arlington, and the culmination of that rise was on January 11th, 1903, when the level of the water in the river was about three feet above the surface of the land. The engineer in charge called your attention to the situation by letter dated December 22nd, 1902, and advised you, for your own protection, to construct at once a run around or protection levee on such lines as he located. On that day, twenty-two days after the time when the levee should have been completed, you had but 94,000 cubic yards in position, on the main levee, or only about forty per cent. of the total yardage in the contract, and but thirty-eight wheel scrapers at work, and your attention was again called to the fact that your force was entirely inadequate to complete the levee before the high water in the spring. Your attention was again called to the inadequacy of your force on this levee by letter of February 4th, 1903, at which time there were only forty-seven wheel scrapers at work.

On February 15th, 1903, the river, on its second rise, again reached the same level as the natural surface of the ground at Arlington ,and from that time on it continued to rise; and on the 20th of February your attention was called to the necessity of enlarging the protection levee to meet the increasing rise in the Mississippi River.

Rains having set in about this time, which interfered with your scraper work, you were obliged, from this time on, to employ a wheelbarrow force to complete this protection levee against the rise in the river, and on March 4th, 1903, you agreed to use convicts on this protection levee at the rate of $1.50 per day per man—

the only terms under which they would go to work on said protection levee. These convicts were on the ground as the result of agreement previously entered into by you with the Board of Control of the State Penitentiary, some time about February 20th, 1903, to build the upper and lower wings of the main line of the Arlington Levee.

The foregoing are the leading and main facts in regard to events at the Arlington Levee, during the life of your contract for its construction, bearing upon the matters at issue.

In conclusion, and to summarize the above, the Board of State Engineers, in full session, begs leave to state that under your contract the Arlington Levee should have been begun on or before June 1st, 1902, and completed on or before December 1st, 1902. Material operations were not begun on it until September 8th, 1902, and owing to the insufficiency of the force maintained by you on the work it was not completed until late in the fall of 1903, or some twelve months after the date on which it should have been completed. The hardship and expenses to which you were subjected, in protecting this work, from high water, were solely due to your failure to complete it within the time specified in the contract, which had been fixed by the Board of State Engineers with the view and purpose of avoiding the very complications which did arise, in consequence of your delay and failure to observe the specifications in regard to time.

Your attention was repeatedly called to the insufficiency of your force on the work and to the results which would probably follow therefrom, the propriety of which precaution was afterwards borne out by the actual occurrences following December 1, 1902.

The loss which you claim to have suffered is to be regretted, but was due to your failure to comply with the 1st specification of your contract, followed by conditions fully covered by specifications 3 and 10 of said contract.

Certificates of payment for every cubic yard of earth measured by the Engineer in Charge, at the completion of the work, have been issued to you, and accepted by you. The Board of State Engineers cannot grant the relief prayed for.

Very respectfully,
*The Board of State Engineers,*
*Per* Frank M. Kerr,
*Chief State Engineer.*

## DATA

## REGARDING THE

# LEVEE DISTRICTS

## OF THE

# MISSISSIPPI VALLEY.

PREPARED FOR THE HONORABLE THEODORE ROOSEVELT, PRESIDENT OF THE UNITED STATES,
BY ARSENE PERRILLIAT.

# SUMMARY OF DATA REGARDING THE LEVEE DISTRICTS OF THE MISSISSIPPI VALLEY.

| | | For details see Page No. |
|---|---|---|
| Total Alluvial Area subject to overflow | 29,790 Sq. Miles | 222 |
| Or | 19,065,600 Acres | 222 |
| Total Area incorporated in Levee Districts under various State laws | 26,952 Sq. Miles | |
| Or | 17,249,642 Acres | 222 |
| Percentage of Area in Cultivation, to Total | 19.7 per cent. | 222 |
| Total number of Levee Districts in Mississippi Valley | 25 | 220 |
| Total number of Commissioners governing same | 155 | 228 |
| Total length of Levee Line in Mississippi Valley on Mississippi River and its Tributaries | 1,956 Miles | 221 |
| Extenson of Levee Line required | 191 Miles | 221 |
| Extension of Levee Line required | 191 Miles | 221 |
| of Orleans | $112,887,591 | 223 |
| Assessment of Orleans | $150,055,240 | 223 |
| Total Revenue for Levee building contributed in 1902 by States and Levee Districts | $2,239,754 | 223 |
| Total contributed by United States Mississippi River Commission for Levee purposes for 1902 | $1,000,000 | 223 |
| Total amount of bonds authorized to be issued by Levee Districts for Levee building | $8,788,000 | 226 |
| Total amount of these bonds already issued | $7,337,700 | 226 |
| Total amount of earthwork estimated necessary to complete Levee line to Mississippi River Commission Grade | 89,086,047 Cu. Yds. | 227 |
| Estimated cost of above earthwork | $17,817,198 | 227 |
| Percentage of present condition of Levee line to estimated completion | 65.9 per cent. | 227 |

The following pages give the details from which the above summary was made. The figures given were gathered from the most trustworthy authorities, namely the Levee Boards' officers themselves. In a few instances, however, especially when the number of acres improved or in cultivation is touched upon, the figures are close approximations.

In a few minor instances, when the data were unobtainable, their place is filled by a question mark, thus "?".

## DATA REGARDING THE LEVEE DISTRICTS OF THE MISSISSIPPI VALLEY.

| LOCAL NAME OF DISTRICT. | Distance of Upper End below Cairo. Miles. | Distance of Lower End below Cairo. Miles. | Length of River Frontage. Miles. | Bank of River on which District is situated. | State. |
|---|---|---|---|---|---|
| Reelfoot of Ky............... | 36 | 56 | 20 | East | Kentucky |
| Reelfoot of Tennessee........ | 56 | 60 | 4 | East | Tennessee |
| Yazoo-Mississippi ............ | 250 | 365 | 115 | East | Mississippi |
| Mississippi .................. | 365 | 580 | 215 | East | " |
| Pontchartrain .............. | 835 | 956 | 121 | East | Louisiana |
| Orleans .................... | 956 | 970 | 14 | East & West | " |
| Lake Borgne .............. | 970 | 1015 | 45 | East | " |
| Grand Prairie ............... | 1015 | 1048 | 33 | East | " |
| Plaquemines Parish E. Bank.. | ...... | ...... | ...... | East | " |
| Bird's Point ................. | 2 | 70 | 68 | West | Missouri |
| St. Francis of Mo............ | 80 | 128 | 48 | West | " |
| St. Francis of Ark........... | 128 | 295 | 167 | West | Arkansas |
| Cotton Belt ................... | ...... | ...... | ...... | West | " |
| Laconia Circle .............. | 334 | 390 | 56 | West | " |
| Red Fork (on Arkansas Riv.) . | ...... | ...... | ...... | West | " |
| Desha ....................... | 410 | 440 | 30 | West | " |
| Chicot ........................ | 440 | 521 | 81 | West | " |
| Tensas Basin ............... | 410 | 521 | 111 | West | Louisiana |
| Fifth Louisiana ............. | 521 | 760 | 239 | West | " |
| Atchafalaya Basin .......... | 765 | 886 | 121 | West | " |
| Lafourche .................. | 886 | 1020 | 134 | West | " |
| Buras ........................ | 1020 | 1050 | 30 | West | " |
| Red River, Atchafalaya and Bayou Bœuf ............. | Levees situated on Red River, Atchafalaya Riv. and Bayou des Glaizes. | | | West bank of streams | " |
| Bossier ...................... | Levees situated on Red River. | | 109 | East | " |
| Caddo ........................ | Levees situated on Red River. | | 159 | West | " |

## DATA REGARDING THE LEVEE DISTRICTS OF THE MISSISSIPPI VALLEY.

| Local Name of District. | Length of Levee line now built in District. Miles. | Additional Length required. Miles. | Comprises the U. S. Levee District known as |
|---|---|---|---|
| Reelfoot of Ky | 5½ | 10 | Reelfoot. |
| Reelfoot of Tennessee | 4½ | None | |
| Yazoo-Mississippi | 124 | None | Upper Yazoo. |
| Mississippi | 188⅓ | None | Lower Yazoo. |
| Pontchartrain | 123½ | None | Pontchartrain. |
| Orleans | 74½ | None | In no U. S. District. |
| Lake Borgne | 48 | None | Lake Borgne. |
| Grand Prairie | 23 | 8 | |
| Plaquemines Parish E. Bank | None | 32½ | |
| Bird's Point | 3½ | 48½ | Upper St. Francis. |
| St. Francis of Mo | 47 | None | Lower St. Francis. |
| St. Francis of Ark | 139 | 24 | |
| Cotton Belt | 62 | 2 | White River. |
| Laconia Circle | 46 | ...... | |
| Red Fork | 35 | 6 | Upper Tensas. |
| Desha | 26½ | 6 | |
| Chicot | 59½ | None | |
| Tensas Basin | 86 | 8 | |
| Fifth Louisiana | 217 | 15 | Lower Tensas. |
| Atchafalaya Basin | 122 (a) | None | Atchafalaya. |
| Lafourche | 119 (b) | None | Lafourche. |
| Buras | 34 | None | Barataria. |
| Red River, Atchafalaya and Bayou Bœuf | 117½ | 12 | Improvement of Red Riv |
| Bossier | 58 | 4 | Improvement of Red Riv |
| Caddo | 82 | 15 | Improvement of Red Riv |
| Totals | 1956.3 | 191 | |

(*a*) Has built and maintains in addition 120 miles of levee, of which 75 miles are situated on Bayou Lafourche, and 45 miles on the Atchafalaya River.

(b) Has built and maintaisn in addition 75 miles of levees on Bayou Lafourche.

## DATA REGARDING THE LEVEE DISTRICTS OF THE MISSISSIPPI VALLEY.

| LOCAL NAME OF DISTRICT | Total Area of District, Acres | Area Improved or in Cultivation, Acres | Area Unimproved or in Forest, Acres | Percentage Cultivated, Area to Total Area |
|---|---:|---:|---:|---:|
| Reelfoot of Ky | 200,000 | 50,000 | 150,000 | 25 |
| Reelfoot of Tennessee | 120,000 | 25,000 | 95,000 | 30 |
| Yazoo-Mississippi | 2,656,000 | ......... | 2,071,680 | 28 |
| Mississippi | 1,660,000 | 584,320 | 1,120,000 | 38 |
| Pontchartrain | 363,000 | 121,000 | 242,000 | 33 |
| Orleans | 120,960 | 24,932 | 96,028 | 20 |
| Lake Borgne | 112,000 | 27,000 | 85,000 | 24 |
| Grand Prairie | 11,000 | 3,000 | 8,000 | 27 |
| Plaquemines Parish E. Bank | 15,642 | 3,000 | 11,742 | 25 |
| Bird's Point | 143,000 | 70,000 | 73,000 | 49 |
| St. Francis of Mo | 378,240 | 78,648 | 302,592 | 20 |
| St. Francis of Ark | 1,058,240 | 211,648 | 846,592 | 20 |
| Cotton Belt | 582,400 | ? | ? | ...... |
| Laconia Circle | 150,000 | 18,000 | 132,000 | 14 |
| Red Fork | 215,000 | 15,000 | 200,000 | 7 |
| Desha | 194,560 | 9,728 | 184,832 | 5 |
| Chicot | 392,000 | ? | ? | ...... |
| Tensas Basin | 2,755,000 | 287,000 | 2,468,000 | 11 |
| Fifth Louisiana | 1,529,000 | 230,223 | 1,299,377 | 15 |
| Atchafalaya Basin | 2,541,000 | 635,250 | 1,905,750 | 25 |
| Lafourche | 796,000 | 134,000 | 562,000 | 17 |
| Buras | 40,000 | 12,000 | 28,000 | 30 |
| Red River, Atchafalaya and Bayou Bœuf | 944,000 | 48,000 | 886,000 | 5 |
| Bossier | 128,640 | ? | ? | ...... |
| Caddo | 143,360 | ? | ? | ...... |
| Totals | 17,249,642 | 3,125,649 | 12,777,593 | 19.7 |

## DATA REGARDING THE LEVEE DISTRICTS OF THE MISSISSIPPI VALLEY.

| Local Name of District. | Assessment for 1902. | Revenue for 1902 from District Taxation. | Additianal Revenue from State Appropriations. | Levee Allotments by U. S. Miss. River Commission. |
|---|---|---|---|---|
| Reelfoot of Ky | ? | $25,000 | | $20,000 |
| Reelfoot of Tennessee | $1,500,000 | ? | | |
| Yazoo-Mississippi | 20,919,585 | 393,339 | | 70,000 |
| Mississippi | 17,000,000 | 345,661 | | 291,000 |
| Pontchartrain | 6,179,449 | 117,840 | $25,000 | 81,500 |
| Orleans | 150,055,240 | 140,542 | 10,000 | |
| Lake Borgne | 1,670,284 | 23,127 | 5,000 | 10,000 |
| Grand Prairie | 179,890 | 7,242 | 3,000 | |
| Plaquemines Parish E. Bank | 265,025 | 10,000 | | |
| Bird's Point | ? | 7,000 | | 20,000 |
| St. Francis of Mo | 2,052,654 | 16,697 | | 125,000 |
| St. Francis of Ark | 20,000,000 | 112,000 | | |
| Cotton Belt | ? | ? | | 90,000 |
| Laconia Circle | ? | 2,600 | | |
| Red Fork | 250,000 | 3,382 | | |
| Desha | 400,000 | 3,387 | | |
| Chicot | ? | ? | | 112,000 |
| Tensas Basin | 3,284,130 | 24,617 | 28,886 | |
| Fifth Louisiana | 6,097,873 | 204,286 | 65,096 | 110,000 |
| Atchafalaya Basin | 15.379,660 | 271,301 | 25,000 | 40,000 |
| Lafourche | 10,633,208 | 167,381 | 20,000 | 20,000 |
| Buras | 431,078 | 6,652 | 5,000 | 10,000 |
| Red River, Atchafalaya and Bayou Bœuf | 3,947,785 | 64,041 | 15,000 | |
| Bossier | 1,416,150 | 25,196 | 15,000 | |
| Caddo | 1,280,320 | 28,621 | 15,000 | |
| Totals | $262,942,831 | $2,001,772 | $237,982 | $1,000,000 |

## DATA REGARDING THE LEVEE DIS-

### *Revenue Derived from*

| LOCAL NAME OF DISTRICT | Ad valorem Tax: Mills per Dollar | Land Tax per Acre | Railroad Tax per mile | On Cotton |
|---|---|---|---|---|
| Reelfoot of Kentucky.......... | 5 | | | |
| Reelfoot of Tennessee.......... | ? | | | |
| Yazoo-Mississippi.............. | 15¾ to 11¼ | 4½c | $2 to $20 | ...................... |
| Mississippi.................... | 5 | 5c | $25 to $100 | 1-5c per lb of lint.<br>1-15c per lb of seed. |
| Pontchartrain.................. | 10 | 3c | $100 | 50c per bale. |
| Orleans........................ | 1 | ............ | ............ | ...................... |
| Lake Borgne.................... | 10 | 5c | $60 | 25c per bale. |
| Grand Prairie.................. | 10 | (1) | $30 | 25c per bale. |
| Plaquemines Parish, E. Bank. | 5 | 40c | ............ | 25c per bale. |
| Bird's Point................... | ............ | (2) | ............ | ...................... |
| St. Francis of Missouri........ | 2 p.c. on a betterm't of $2 per acre. | ............ | 2 p.c. on a betterment of $1000. | ...................... |
| St. Francis of Arkansas........ | 2 p.c. on a betterm't of $3 per acre. | ............ | $45 | ...................... |
| Cotton Belt.................... | | | | |
| Laconia Circle................. | 10 | None | | |
| Red Fork....................... | 20 | ............ | ............ | ...................... |
| Desha.......................... | 8 | ............ | $16 | |
| Chicot......................... | | | | |
| Tensas Basin................... | 5 | ............ | ............ | ...................... |
| Fifth Louisiana................ | 10 | 5c | $20 to $100 | $1 per bale. |
| Atchafalaya Basin.............. | 10 | 2½c | $60 | 25c per bale.<br>2c per 100 lbs. seed. |
| Lafourche...................... | 10 | 2½c | $50 to $100 | 25c per bale. |
| Buras.......................... | 10 | 5c | $30 | 25c per bale. |
| Red River, Atchafalaya and Bayou Bœuf.................. | 10 | 5c | $60 | ...................... |
| Bossier........................ | 10 | 5c | $60 | 50c per bale. |
| Caddo.......................... | 10 | 5c | $60 | 50c per bale. |

(1) $1.00 on every arpent of frontage on Mississippi River.
(2) 40 per cent. upon the benefits assessed

TRICTS OF THE MISSISSIPPI VALLEY.

*Taxation as follows:*

| On Sugar | On other Produce | Revenue from District taxation applied to assessment represents a tax of |
|---|---|---|
| ........................................ | All State Licenses duplicated and charged for. | 18.7 mills |
| ........................................ | ........................................ | 20.3 “ |
| 15c per bbl., 50c per hhd., 5c per bbl. molasses. | 3c per sack rice. | 20.0* “ |
| ........................................ | ........................................ | 1.9* “ |
| 10c per bbl., 35c per hhd., 5c per bbl molasses, and 7½c per bbl of syrup. | 2½c per bbl rice, 2½c per bushel oranges, ½c per bushel esculents. | 14.8* “ |
| 10c per bbl., 25c per hhd., 5c per ton sugar cane, 7⅓c per bbl syrup, 5c per bbl molasses. | 5c per bbl rough rice, 3c per bbl oysters, 3c per bbl esculents, 5c per bbl oranges. | 41.2* “ |
| 10c per bbl., 35c per hhd., 5c per ton sugar cane, 7½c per bbl. syrup, 5c per bbl molasses. | 5c per bbl rice, 5c per bbl oranges, 3c per bbl fruit, 3c per bbl vegetables. | 37.7 “ |
| ........................................ | ........................................ | .............. |
| ........................................ | ........................................ | 8.1 “ |
| ........................................ | ........................................ | 5.6 “ |
| ........................................ | ........................................ | 20.0 “ |
| ........................................ | ........................................ | 8.4* “ |
| ........................................ | ........................................ | 34.5* “ |
| 25c per 1,000 lbs., 4c per ton sugar cane, 7½c per bbl syrup, 5c per bbl molasses. | 1¼c per sack rough rice. | 18.6* “ |
| 10c per bbl., 35c per hhd., 5c per ton sugar cane, 3c per 100 lbs sugar, 7½c per bbl syrup, 5c pr bl molases | 2½c per sack rough rice, ½c per bu esculents, 2½c per bbl oranges, 2½c per sack oysters. | 16.7* “ |
| 5c per ton sugar cane. | 2½c per bbl oysters and esculents, 5c per bbl rice and oranges. | 18.7* “ |
| ........................................ | ........................................ | 17.2* “ |
| ........................................ | ........................................ | 18.7* “ |
| ........................................ | ........................................ | 23.3* “ |

NOTE—To the figures marked thus “*” one mill general State levee tax is added.

## DATA REGARDING THE LEVEE DISTRICTS OF THE MISSISSIPPI VALLEY.

| LOCAL NAME OF DISTRICT | Bonds Authorized by law to be issued for levee building. | Bonds already issued |
|---|---|---|
| Reelfoot of Ky | $ 100,000 | $ 100,000 |
| Reelfoot of Tennessee | 100,000 | 100,000 |
| Yazoo-Mississippi | 1,075,000 | 1,049,000 |
| Mississippi | 1,150,000 | 1,150,000 |
| Pontchartrain | 1,000,000 | 786,000 |
| Orleans | 500,000 | 325,000 |
| Lake Borgne | 100,000 | 100,000 |
| Grand Prairie | 30,000 | 25,000 |
| Plaquemines Parish E. Bank | 135,000 | 135,000 |
| Bird's Point | 263,000 | 100,000 |
| St. Francis of Mo | 150,000 | None |
| St. Francis of Ark | 1,000,000 | 750,000 |
| Cotton Belt | ? | ? |
| Laconia Circle | ? | 14,000 |
| Red Fork | None | |
| Desha | None | |
| Chicot | ? | ? |
| Tensas Basin | 150,000 | 69,000 |
| Fifth Louisiana | 500,000 | 500,000 |
| Atchafalaya Basin | 1,000,000 | 850,000 |
| Lafourche | 500,000 | 250,000 |
| Buras | 35,000 | 35,000 |
| Red River, Atchafalaya and Bayou Bœuf | 500,000 | 500,000 |
| Bossier | 200,000 | 199,900 |
| Caddo | 300,000 | 299,800 |
| Totals | $ 8,788,000 | $ 7,337,700 |

## DATA REGARDING THE LEVEE DISTRICTS OF THE MISSISSIPPI VALLEY

| LOCAL NAME OF DISTRICT | Number of Cubic Yards in present levee line | Total Cubic Yards there should be in line to bring to M. R. C. grade | Deficiency in yardage to bring to M. R. C. grade | Percentage of present condition with regard to completed line | Approximate amount of money required to build up deficiency |
|---|---|---|---|---|---|
| Reelfoot of Ky. | 382,682 | 2,305,414 | 1,722,792 | 25.3 | $ 344,558 |
| Reelfoot of Tennessee | | | | | |
| Yazoo-Mississippi | 20,872,878 | 27,668,531 | 6,795,653 | 75.4 | 1,359,130 |
| Mississippi | 43,242,456 | 33,242,456 | 13,434,970 | 71.2 | 2,686,994 |
| Pontchartrain | 14,578,759 | 14,578,759 | 4,460,013 | 76.5 | 692,009 |
| Orleans | | | | | |
| Lake Borgne | 3,402,634 | 4,896,743 | 1,496,089 | 69.5 | 299,316 |
| Grand Prairie | | | | | |
| Plaquemines Parish E. Bank | | | | | |
| Bird's Point | 385,898 | 5,462,548 | 5,076,650 | 7.1 | 1,015,330 |
| St. Francis of Mo. | 13,965,898 | 24,497,661 | 10,532,583 | .57 | 2,106,516 |
| St. Francis of Ark. | | | | | |
| Cotton Belt | 7,718,965 | 16,638,218 | 8,919,253 | 46.4 | 1,783,850 |
| Laconia Circle | | | | | |
| Red Fork | | | | | |
| Desha | 29,092,848 | 45,328,486 | 16,235,638 | 64.2 | 3,247,126 |
| Chicot | | | | | |
| Tensas Basin | | | | | |
| Fifth Louisiana | 17,947,083 | 28,831,072 | 100,883,989 | 62.2 | 2,176,796 |
| Atchafalaya Basin | 19,411,930 | 24,751,338 | 5,339,408 | 78.4 | 1,067,660 |
| Lafourche | 8,125,872 | 10,788,722 | 2,662,850 | 75.3 | 532,570 |
| Buras | 2,879,868 | 4,406,027 | 1,526,159 | 65.4 | 305,330 |
| Totals | 172,206,931 | 261,292,978 | 89,086,047 | 65.9 | $17,817,198 |

# DATA REGARDING THE LEVEE DISTRICTS OF THE MISSISSIPPI VALLEY.

| LOCAL NAME OF DISTRICT. | Number of Commissioners composing Levee Board. | Domicile of Board of Commissioners. | District comprises entire Counties or Parishes of | District comprises parts of Counties or Parishes of |
|---|---|---|---|---|
| Reelfoot of Kentucky | 5 | Hickman, Ky. | | Fulton. |
| Reclfoot of Tennessee | 3 | Tiptonville, Tenn | | Lake, Dyer and Obion. |
| Yazoo-Mississippi | 12 | Clarksdale, Miss | Tunica, Coahoma, Quitman and Sunflower. | De Soto, Tallahatchie, Deflore, Holmes and Yazoo. |
| Mississippi | 6 | Greenville, Miss | Bolivar, Washington, Issaquena and Sharkey | Warren. |
| Pontchartrain | 9 | Convent, La. | | E. Baton Rouge, Iberville, Ascension, St. James, St. John, St. Charles and Jefferson. |
| Orleans | 9 | New Orleaas, La. | Orleons | |
| Lake Borgne | 3 | St. Bernard Court House, La. | St. Bernard | Plaquemines. |
| Grand Prairie | 3 | Pointe a la Hache, La. | | Plaquemines. |
| Plaquemines Parish, E. Bank | 5 | Pointe a la Hache, La. | | Plaquemines. |
| Bird's Point | 3 | Charleston, Mo | | Mississippi. |
| St. Francis of Missouri | 9 | Caruthersville, Mo. | Pemiscot | Dunklin and New Madrid. |
| St. Francis of Arkansas | 24 | West Memphis, Ark | Mississippi and Crittenden | Craighead, Peinsett, Cross, Lee and Phillips. |
| Cotton Belt | ? | | | |
| Laconia Circle | 3 | Laconia, Ark | | Desha and Phillips. |
| Red Fork | 3 | Red Fork, Ark | | Desha. |
| Desha | 3 | Arkansrs City, Ark | | Desha. |
| Chicot | ? | | Chicot | |
| Tensas Basin | 7 | Monroe, La. | Catahoula, W. Carroll, Franklin, Morehouse & Richland. | |
| Fifth Louisiana | 8 | Delta, La | E. Carroll, Tensas, Madison and Concordia. | |
| Atchafalaya Basin | 7 | Port Allen, La | Pt. Coupee, W. Baton Rouge and Terrebonne. | Iberville, Ascension, Assumption, Lafourche, Iberia, St. Mary and St. Martin. |
| Lafourche | 9 | Gretna, La. | | Assumption, St. James, St. John, Lafourche, St. Charles, Jefferson and Plaquemines. |
| Buras | 5 | Buras, La. | | Plaquemines. |
| Red River, Atchafalaya and Bayou Bœuf | 3 | Alexandria, La | | Rapides, Avoyelles and St. Landry. |
| Bossier | 7 | Bossier City, La. | | Bossier. |
| Caddo | 7 | Shreveport, La. | | Caddo. |

## Length of Levee Line in Louisiana and in part of Arkansas protecting Louisiana.

| NAME OF STATE LEVEE DISTRICTS | Miles on Mississippi R. | Miles on Bayou LaFourche | Miles on Athafalaya R. | Miles on Red River | Miles on Other Streams | Total Miles by Districts |
|---|---|---|---|---|---|---|
| Tensas Basin | ...... | ...... | ...... | ...... | a 40.0 | 40.0 |
| Fifth Louisiana | 232.3 | ...... | ...... | ...... | b 39.0 | 271.3 |
| Atchafalaya Basin | 128.1 | 75.0 | 41.9 | ...... | ...... | 245.0 |
| Pontchartrain | 125.6 | ...... | ...... | ...... | ...... | 125.6 |
| Lafourche Basin | 119.4 | 74.1 | ...... | ...... | ...... | 193.5 |
| Orleans | 26.5 | ...... | ...... | ...... | c 48.0 | 74.5 |
| Lake Borgne Basin | 48.6 | ...... | ...... | ...... | ...... | 48.0 |
| Grand Prairie | 29.3 | ...... | ...... | ...... | ...... | 29.3 |
| Buras | 33.7 | ...... | ...... | ...... | ...... | 33.7 |
| Caddo | ...... | ...... | ...... | 79.2 | d 9.0 | 88.2 |
| Bossier | ...... | ...... | ...... | 57.1 | ...... | 57.1 |
| Red River, Atchafalaya and Bayou Bœuf | ...... | ...... | 29.4 | 36.8 | e 48.0 | 114.1 |
| Cat Island | 12.8 | ...... | ...... | ...... | ...... | 12.8 |
| State of Arkansas, protecting Louisiana | 71.8 | ...... | ...... | ...... | f 28.0 | 99.8 |
| Outside of Levee Districts | ...... | ...... | ...... | 31.8 | ...... | 31.8 |
| Totals by streams | 827.5 | 149.1 | 71.3 | 204.9 | 212.0 | 1464.8 |

a Includes 10 miles on Ouachita, 17 miles on Black and 13 miles on Little River.
b Includes 12 7 miles on Black and 26.3 miles on Tensas River.
c Rear Levees, etc.
d All on Bayou Pierre
e All on Bayou des Glaizes.
f Includes 15.0 miles on Arkansas River below Red Fork and 13.0 miles on Amos Bayou and Cypress Bayou (cross line.)

OFFICE BOARD STATE ENGINEERS,
New Orleans, La., April, 1904.

| STATIONS. | Elevation of Gage Zero above Cairo Datum Plane. | Highwater, 1897. |  | Highwater, 1903. |  | Highest Water of Record. |  |
|---|---|---|---|---|---|---|---|
|  |  | Date. | Gage Reading. | Date. | Gage Reading. | Year. | Gage Reading. |
| MISSISSIPPI RIVER. |  |  |  |  |  |  |  |
| St. Louis, Mo | 400.23 | May 2nd. | 30.90 | Mch. 11th | 25.2 | 1844 | 41.4 |
| Cape Girardeau, Mo | 324.97 | Apl. 12th and 13th. | 31.60 | Mch. 12th | 28.4 | 1892 | 35.0 |
| Cairo, Ill. | 290.84 | Mch. 25th to 28th | 51.70 | Mch. 15th-17th | 50.6 | 1883 | 52.2 |
| Columbus, Ky., Belmont, Mo. | 286.76 | Mch. 26th to 30th | 45.00 | Mch. 16th-19th | 44.4 | 1883 | 45.6 |
| New Madrid, Mo. | 275.72 | Mch. 29th | 40.27 | Mch. 16th-18th | 39.5 | 1884 | 41.5 |
| Cottonwood Pt., Mo. | 250.67 | Mch. 21st-23rd | 39.35 | Mch. 20th-21st | 40 0 | 1903 | 40.0 |
| Fulton, Tenn. | 228.55 | Mch. 23rd | 37.47 | Mch. 19th | 40.1 | 1903 | 40.1 |
| Memphis, Tenn. | 203.97 | Mch. 20th | 37.66 | Mch. 21st | 40.1 | 1903 | 40.1 |
| Mhoon Ldg., Miss. | 181.48 | Apl. 4th | 41.60 | Mch. 25th-26th | 41.8 | 1903 | 41.8 |
| Helena, Ark. | 161.98 | Apl. 4th | 51.75 | Mch. 26th-27th | 51.0 | 1897 | 51.75 |
| Sunflower Ldg., Miss. | 147.08 | Mch. 27th | 47.17 | Mch. 27th-28th | 48.00 | 1903 | 48.00 |
| Mouth of White River, Ark. | 128.73 | Mch. 29th | 52.42 | Mch. 28th-29th | 53.7 | 1903 | 53.7 |
| Arkansas City, Ark. | 116.44 | Mch. 29th | 51.90 | Mch. 27th-28th | 53.0 | 1903 | 53.0 |
| Greenville, Miss. | 108.00 | Mch. 29th | 46.75 | Mch. 27th | 49.1 | 1903 | 49.1 |
| Lake Providence, La. | 89.62 | Mch. 30th | 44.54 | Mch. 27th-28th | 46.4 | 1903 | 46.4 |
| Vicksburg, Miss. | 66.04 | Apl. 16th | 52.48 | Mch. 27th-29th | 51.8 | 1897 | 52.48 |
| St. Joseph, La. | 52.74 | Apl. 17th | 47.85 | Mch. 27th-29th | 48.0 | 1903 | 48.0 |
| Natchez, Miss. | 36.89 | May 2nd | 49.82 | Mch. 28th, Apl. 1st-2rd and 4th | 50.4 | 1903 | 50.4 |
| Red River Ldg., La. | 23.85 | May 14th-15th | 50.20 | Apl. 8th and 9th | 50.0 | 1897 | 50.2 |
| Bayou Sara, La. | 23.95 | May 13th-15th | 43.70 | Apl. 8th-10th | 43.4 | 1897 | 43.7 |
| Baton Rouge, La. | 20.06 | May 13th-15th | 40.65 | Apl. 6th-10th | 40.0 | 1897 | 40.65 |
| Plaquemine, La. | 21.06 | May 13th-17th | 36.25 | Apl. 5th and 8th | 36.1 | 1897 | 36.25 |
| Donaldsonville, La. | 19.48 | May 13th | 32.75 | Apl. 4th to 10th | 32.2 | 1897 | 32.75 |
| College Pt., La. | 21.24 | May 15th | 27.95 | Apl. 5th to 7th | 27.8 | 1897 | 27.95 |
| Carrollton, La. | 20.91 | May 13th | 19.17 | Mch. 26th to 29th, Apl. 5th-8th | 19.4 | 1903 | 19.4 |
| New Orleans, La. | 18.73 | May 13th | 19.50 | Mch. 30th, Apl. 6th and 7th | 20.3 | 1903 | 20.3 |
| Fort Jackson, La. | 19.26 | Apl. 22nd-29th, May 14th-16th | 7.2 | Apl. 2, 5, 6, 7, 8, 12, 13 | 8.0 | 1903 | 8.0 |
| ATCHAFALAYA RIVER. |  |  |  |  |  |  |  |
| Barbres Ldg., La. | 24.17 | May 13th-14th | 50.95 | Apl. 7th-12th | 50.60 | 1897 | 50.95 |
| Melville, La. | 20.17 | May 15th | 36.10 | Apl. 4th | 38.7 | 1903 | 38.7 |
|  |  | High Water 1892 |  | High Water 1902 |  |  |  |
| RED RIVER. |  | Date | Guage reading | Date | Guage reading |  |  |
| Fulton, Ark. | 244.78 | Mch. 23rd-24th | 34.80 | Nov. 30th, Dec. 1st | 32.20 | 1876 | 35.75 |
| Shreveport, La. | 161.27 | May 28th | 35.70 | Dec. 15th-16th | 34.10 | 1892 | 35.70 |
| Alexandria, La. | 64.46 | June 12th-13th | 38.25 | Dec. 24th | 34.20 | 1892 | 38.25 |

# INDEX

A

Acts of the General Assembly Creating Board of State Engineers........3
    Creating Levee Districts..................................3, 4
    Relative to riding, driving and hauling over public levees......210
Assessment, Total of Levee Districts..............................11
Ashwood Levee.....................................................31
Ash Point Levee...................................................34
Adams to Short St., levee location approved......................133
Aurora Enlargement, probable life of.............................133
Atchafalaya Basin Levee District—
    Act creating...................................................3
    Parishes composing, assessment, frontage, length of line, Commissioners, domicile, etc. ..............................17,18
    Levee Work Done.........................18, 19, 50, 56, 62, 82, 88, 94
    Grade and section of work done on Mississippi River...........18
    High Water of 1903.........................................19, 20
    Grade and section of work done on the Atchafalaya River......19
    Crevasses.....................................................20
    Reports of Board of State Engineers to.................110-112
Amos Bayou, Levee line on........................................11
Arkansas River, Project to extend levee line on..................12
Atchafalaya River—
    Levee Work done on east bank........................18, 19, 98
    Grade and section of work done on east bank..................19
    Levee Work done on west bank........................35, 36, 98
    High Water 1903................................36, 39, 161-164
    Length of levee line........................................8, 9
Arlington Levee—
    Under contract by State.....................................117
    Answer to J. K. Jeffries & Sons' petition for relief.........213
Angelina, New levee required.....................................118

B

Board of State Engineers—
    Act creating...................................................3
    Duties and personnel of.....................................3, 5
    Appropriations for.............................................5
    Appointment of members of......................................5
Bossier Levee District—
    Act creating...................................................4
    Territory embraced............................................32
    Assessment, Commissioners.....................................33
    Length and description of levee lines.........................33
    Levee work done..........................33, 54, 56, 74, 82, 96
    Minor repairs to levee lines, and high water expenses.........33
    Condition of levee lines.............................34, 150-155
    High Water 1903......................................34, 156-158
    Grade of levee lines..........................................34
    Caving banks and new levees...................................34
    Reports of Board of State Engineers to.................150-160
Buras Levee District—
    Act creating...................................................4
    Territory embraced, length of levee line, assessment, Commissioners, domicile.........................................29
    Levee work done..............................29, 52, 56, 89, 94
    Minor repairs to levee line...................................30
    High Water of 1903............................................30

- Bayou Lafourche Project..........40, 41, 42
  - Engineering work required..........4
  - Work executed and remaining to be done..........7, 78, 82
  - Special reports relative to improvement of Bayou Lafourche, etc. ..........193-200
  - Special reports relative to work undertaken..........201-208
- Bank Protection Work in R. R. A. and B. B. Levee District..........37, 38
- Bayou Courtableau—
  - Estimate and report on levee line..........168-170
- Bougere ..........16, 17, 208
- Bayou Lafourche Dam—
  - Special reports relative to..........205-207
- Bayou Lamairie Dam, Destrucion of..........37
  - Report on ..........164-167
- Bayou Lafourche
  - High Water 1903 in ..........20, 24, 39, 126, 127
  - Crevasses on ..........20, 39
  - Levee work done ..........100
- Bonds, total authorized to be issued by Levee Districts..........11
- Buckhorn ..........34
- Bayou des Glaizes—
  - High Water of 1903..........36, 39, 161-164
  - Length of levee line..........9
  - Levee work done..........98
  - Extension of levee line on..........168
- Bayou Rapides—
  - Levee work done..........100

C

- Caddo Levee District—
  - Act creating ..........3
  - Territory embraced, assessment, Commissioners, domicile..........30
  - Length and description of levee lines..........30
  - Levee work done ..........31, 54, 56, 72, 82, 96
  - Minor repairs to levee line and high water expenses..........31
  - Condition of levee line ..........31
  - High Water 1903 ..........31, 138-141
  - Crevasse ..........31
  - Grade of levee lines..........31,32,139
  - Caving banks ..........32
  - Reports of Board of State Engineers to..........136-149
- Cat Island Levee District—
  - Act creating ..........4
  - Territory embraced, Commissioners, bonds authorized..........20
- Courtableau Levee District—
  - Act creating ..........4
  - Territory embraced, bonds authorized..........38
  - Estimated cost of levee line..........38
  - Report of Board of State Engineers to..........168-170
- Chapman New Levee..........18
- Caspiana, bank changes, etc. ..........137
- Chicoot Levee District, Arkansas..........12
- Crevasses—
  - On Mississippi River..........14, 17, 23, 24, 27, 39, 126, 127.
  - On Bayou Lafourche..........20, 39
  - On Red River..........31, 39
- Caving Banks—
  - On Red River ..........32, 34
  - In Ponthcartrain District..........118
- Campo Bello and Cross Keys..........32
- Christiana ..........34

D.

Desha Levee Boards, Arkansas....12
Drainage work in R. R. A. & B. B. District....35, 36, 37, 78, 82
Darrowville, new levee required....118
Drainage Ditch from Little Pass to Soda Lake, estimate, etc....138
Data regarding Levee Districts of Mississippi Valley....218-230

E

Eliza New Levee....18

F

Fifth Louisiana Levee District....13
  Act creating....3
  Parishes composing....13
  Assessment....13
  Length of Levee Line....13
  Commissioners....13
  Levee work done by....13, 48, 56, 60, 82, 86, 94
  High water of 1903 in....13, 14
  Crevasses in....14, 17
  Area of overflow in....14, 15, 17
  Bougere....16
Falgout Crevasse....20
Fulton Lake, Enlargement of....109

G

Grand Prairie Levee District—
  Act creating....4
  Territory embraced, length of levee line, assessment, Commissioners, domicile....26
  Levee work done....26, 52, 56, 68, 82, 91, 94
  Minor repairs to levee line....26
  High Water 1903....26
  Crevasses....27
  Overflow....27
Guidry Crevasse....20
Gold Dust....34
Gulf Coast—
  Levee work done....100, 135, 136

H

Hollybrook Crevasse....14
  Efforts to close....15, 16
High Water Water, 1903—....19, 38, 39, 178-180
  On MississippiRiver,
    13, 14, 20, 21, 22, 23, 24, 25, 26, 27, 30, 119, 125, 126
  On Bayou Lafourche....20, 39, 126, 127
  On Red River....31, 34, 36, 39, 138-141, 156-158, 161-164
  On Atchafalaya River....36, 39, 161-164
  On Bayou des Glaizes....36, 39, 161-164
Howell Crevasse....20
  Extent of overflow....111
Hogs Skin Point....33
Hurricane Bluff Levee....31
Hymelia Crevasse....23, 126
Hopewell....34
Hermitage, New levee required....118

**I**

Irvine New Levee........18

**J**

Jackson Barracks to U. S. Cemetery, Estimate for enlarging and revetting levees........134

**K**

Klotzville Levee, Raising prior to 1903 H. W........112

**L**

Lafourche Basin Levee District—
    Act creating........3
    Parishes composing, length of levee line, assessment, Commissioners, domicile........22
    Levee work done........22, 23, 50, 56, 66, 82, 88, 94
    Minor repairs to levees etc.........23
    High Water 1903........23, 125, 126, 127
    Crevasses........23, 24
    High water expenses, 1903........23
    Reports of Board of State Engineers to........125-132
    Statement of condition and requirements of levee line........125-132
Lake Borgne Basin Levee District—
    Act creating........3
    Parishes composing, length of levee line, assessment, Commissioners........25
    Levee work done........25, 52, 56, 91, 94
    Minor repairs, etc.........25
    High water expenses, 1903........25
    Hight Water, 1903........25, 26
    Report of Board of State Engineers to........133-135
Land surveys........4, 43, 44
Lefebvre New Levee........18
Leland Spur........109
Levee work of past two years........6
    Remaining under contract........7
    Undertaken by the Districts........57-83
    Undertaken by the State........48-57
    Undertaken by the U. S.........84-93
    According to Disricts........94-97
    According to streams........98-101
    Grand total........102-103
Levee System—
    Description and lengths of lines........7, 8, 9
Levee Districts........10
    Acts creating........3, 4
    Aggregate of bonds authorized........11
    Total assessment of........11
    Data regarding........218-230
Lovely Point........32

**M**

Machinery applicability to levee construction........10
Magnolia Crevasse........23
    Closure of........24, 126
Magnolia Levee........32
    New levee required, etc.........137

Mississippi River—
  Levee work done .....................................98
  Length and description of levee lines ...................8, 9
  High Water, 1903,
    13, 14, 20, 21, 22, 23, 24, 25, 26, 27, 30, 39, 119, 125, 126
  Crevasses ....................................14, 17, 23, 24, 27, 39, 126
Munson Levee, Raising prior to 1903 H. W. ..........................112
Mississippi River Commission—
  Report to Governor relative to meeting of July 2, 1902........175
  Allotments by ......................................176-177
  Report to relative to high water of 1903, and condition and needs of levees ..............................177-189

N

New Basin Canal and Shell Road.................................4
  Work done ......................................42, 43
New Iberia Ship Canal, report relative to.........................211
New levees, Constructions of ...................................9
Kinock Bayou ..................................................33
New Hope, New Levee required.................................118

O

Orleans Levee District—
  Act creating ................................................4
  Territory embraced, Commissioners..........................24
  Work done by ..............................24, 25, 80, 82, 94
  Grade and length of levee line........................24, 25
  Report of Board of State Engineers to.......................133
Opossum Fork Levee............................................11
Overflow, Extent of..........................14, 15, 17, 27, 111, 185
Orleans enlargement approved.................................133

P

Pontchartrain Levee District—
  Act creating ................................................3
  Parishes composing, length of line, assessment, Commissioners, domicile, etc. ..........................................21
  Levee work done........................21, 50, 56, 64, 82, 89, 94
  Minor repairs to levees, ec. .................................21
  High Water, 1903, in ..................................21, 22
  Condition and requirements of levee line................113-117
  High water expenses.................................21, 22, 119
  Reports of Board of State Engineers to....................113-125
Plaquemines Parish East Bank Levee District—
  Act creating ................................................4
  Territory embraced, purpose of act of incorporation, bonds authorized, domicile ...................................28, 29
  Work contracted for .........................................28
  Work done and remaining to be done..............28, 29, 70, 82, 94
  Report of Board of State Engineers to....................135-136
Public Roads .................................................4
Palo Alto New Levee...........................................18
Pascagoula Levee .............................................31
Pandora Levee ................................................32
Phillips to Mercers...........................................34

**R**

Red River Atchafalaya & Bayou Bœuf Levee District—
  Act creating ........................................3
  Drainage work done by and remaining under contract............6
  Territory embraced ..................................34, 35
  Exemption of certain lands...............................35
  Assessment, Commissioners ................................35
  Levee work done..........................35, 54, 56, 76, 82, 96
  Minor repairs to levee lines and high water expenses.............35
  Length of levee lines....................................35, 36
  High Water, 1903.................................36, 161-164
  Drainage work ...........................................37
  Bank protection work ...................................37, 38
  Reports of Board of State Engineers to..................161-168
  Drainage work done......................................35, 78
  Condition of levee lines................................162-164
Railroads operating on levees..................................4
Red River—
  Length and description of levee lines................8, 9, 30, 33
  Levee work done.....................................31, 33, 35, 98
  Condition of levee lines................................31, 34, 36
  High Water, 1903.........31, 34, 36, 39, 138-141, 156-158, 161-164
  Grade of levee lines......................................31, 34
  Crevasses ...................................................31
  Caving banks ..............................................32, 34
  Special report of L L. Griffith, U. S. Junior Engineer, relative to ...........................................189-191
Red Fork Levee District .......................................12
Right of way for levees in Arkansas...........................113

**S**

Solitude New Levee.............................................18
Simpson Lake Levee.............................................31
Swift Chute Bayou..............................................33
Scarsdale, new levee recommended..............................134
Stage of the Rivers........................................38, 39
Surveys of State Lands.....................................43, 44
Sandy Bayou, report on construction of dike across............107
Statement of condition and requirements of levee lines of—
  Pontchartrain District ........................113-118, 118-125
  Lafourche District .....................................128-132
Second Street Levee, location approved........................133
Ship Island Canal Co. Locks, Report on........................135
State House Grounds—
  Report on improvement of................................171-175

**T**

Tensas Basin Levee District....................................11
  Act creating .................................................3
  Parishes embraced in district, Commissioners, assessment, etc...11
  Levee work done......................................11, 58, 83
  Levee work done by U. S. ....................................11
  Reports of Board of State Engineers to..................107-110
Texas & Pacific R. R. embankment across Bougere............16, 17
Taylor New Levee...............................................18
Texas New Levee................................................18

**W**

White Hall ....................................................32
Willow Chute ..................................................34